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Better Homes and Gardens®

WOOD®

THE #1 MAGAZINE FOR HOME WOODWORKERS

$3.95

OCTOBER 1989 ● ISSUE NO. 31
Display until October 10

BOY! DID WE HAVE A TOY CONTEST!

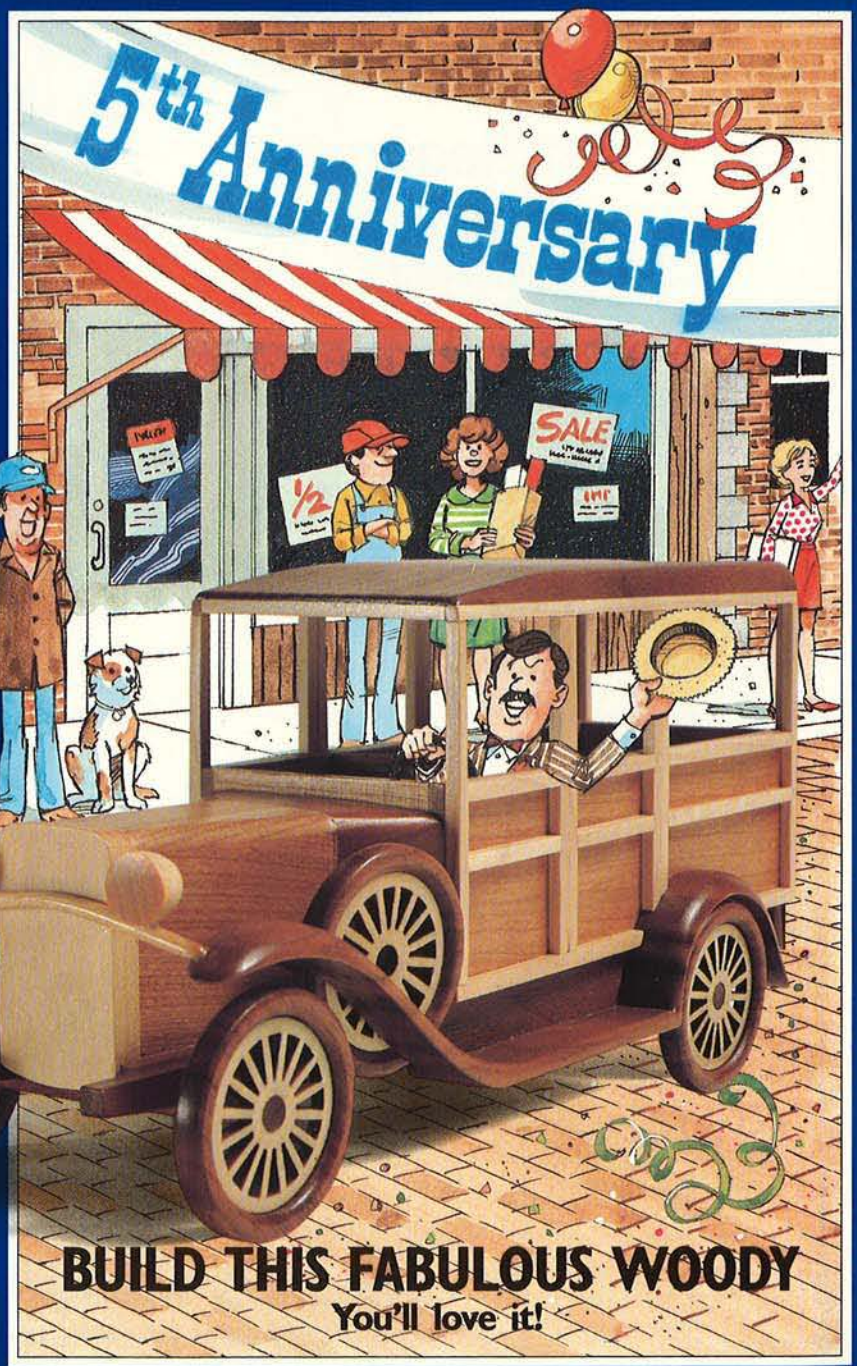
Winners: page 38

TIPS GALORE FOR SMALL-SCALE PROJECTS

WOOD® UPDATE
WHAT'S HAPPENING TO THE WORLD'S WOODS?

JOINTER BASICS AND BUYMANSHIP

IRRESISTIBLE!
Waddling duck
Woven basket
Candle holder
Tabletop frame



BUILD THIS FABULOUS WOODY
You'll love it!

10
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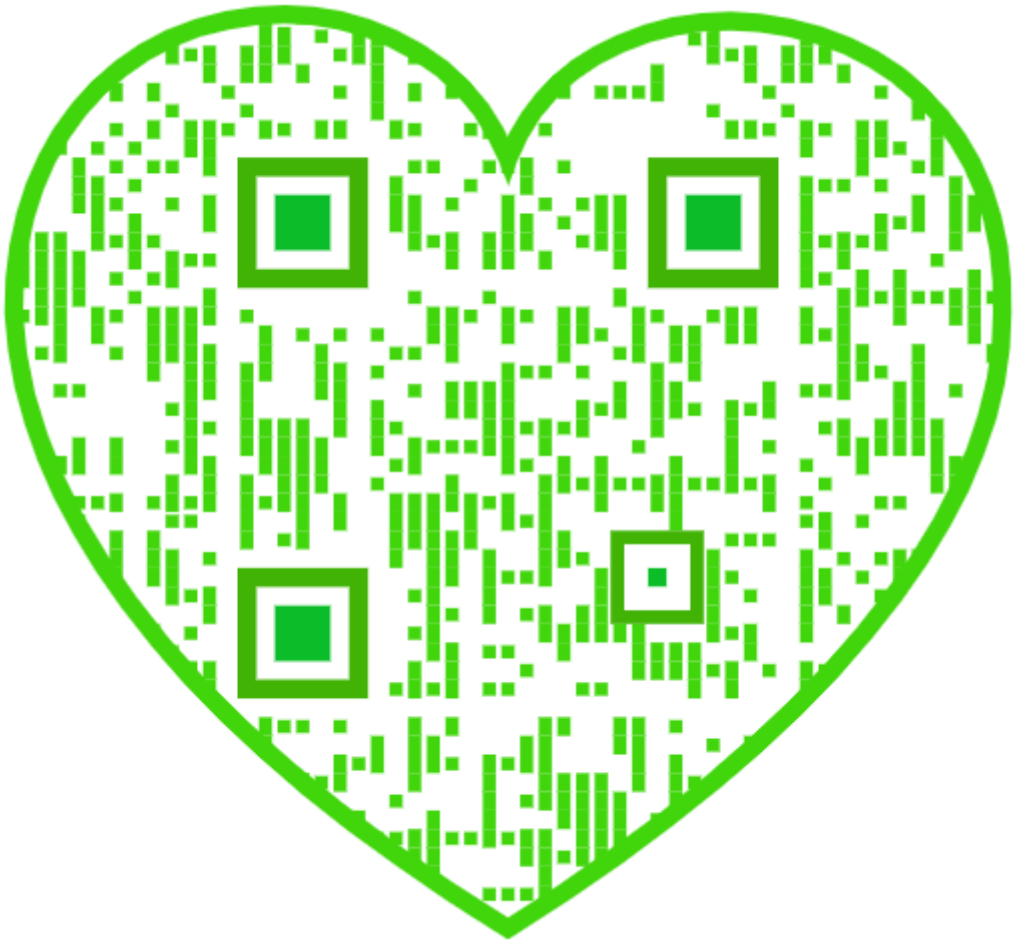

Our New Cordless Drills Are Turning Some Heads.

Two Great Reasons To Turn To Freud.

The variable two speed, reversible 9.6 volt drill with 6 position clutch and brake – AND – the two speed, reversible 7.2 volt drill with belt clip. Lightweight, extremely comfortable and engineered for the job at hand. Whether your needs are around the home, shop or on a remote site, these drills deliver the performance you need and expect from Freud tools.

Model #	*9638VRC*	*7238RC*
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Reversible	Yes	Yes
Chuck Size	3/8″	3/8″
Torque Settings	6	1
Speed	2 (Variable)	2
Speed Range	0-400 RPM and 0-1100 RPM	250 RPM or 600 RPM

Both drills have a 3/8 inch chuck for maximum versatility. The fast charge battery can be ready to go with an hour or less charging time. The reversing switch is conveniently located above the trigger for quick access. The overload breaker protects the motor from damage and can be easily reset when tripped. The chuck key is conveniently stored in a locked position on top of each drill.

Each drill comes in a blow mold carrying case with a 1 Hour Fast Charge Battery and Charger.

With all of these built-in features, Freud gives you what you need and expect from a cordless drill. Put one of these professional cordless drills in your hand today. The 9.6 (9638VRC) list price: $189.90 and the 7.2 (7238RC) list price: $129.90. Call us for the name of your local distributor.

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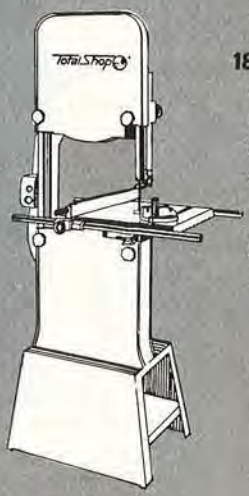
The Total Shop multi purpose machine is strong, precise and versatile, not to mention priced so that owning your own woodworking shop is a real possibility and not a problem.



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- 1½ hp
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- 400 lbs.

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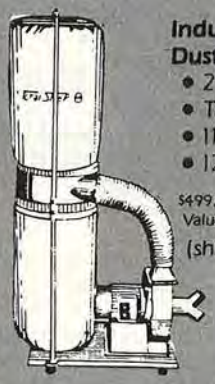

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- Two 4" inlets
- 1185 CFM
- 125 lbs.

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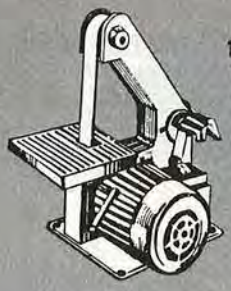
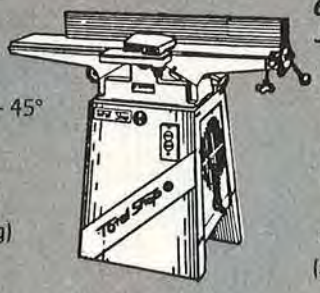


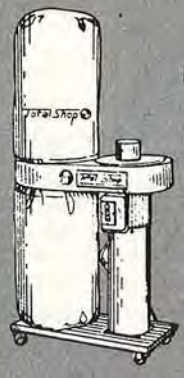
1" Belt Sander
- ⅓ hp
- 16 lbs.
- Table tilts 0° - 45°
- Die-cast aluminum

$59.95
(UPS shipping)



6" Long Bed Jointer
- ¾ hp, 110v
- Fence tilts 45° both ways.
- Fully adjustable
- 190 lbs.

Reg. $499.00 **$299.00**
(ships freight collect)



Dust Collector
- 1 hp, 110v
- 4" inlet
- Commercial quality
- Compact size

Reg. $348.00 **$209.00**
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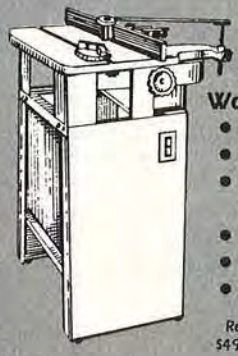

Wood Shaper
- ½" Spindle
- 1 hp
- Cast iron construction
- Precision fence
- 160 lbs.
- Ball bearings

Reg. $499.00 **$259.00**
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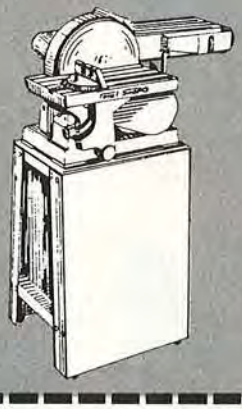
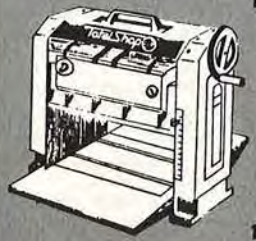


6" Belt & 9" Discs Sander
- ¾ hp
- 6" x 48" belt
- Cast iron construction
- 152 lbs.
- 9" Sanding Disc Included
- Ball Bearings

$199.00
(ships freight collect)



12" Thickness Planer
- Depth of cut ⅛"
- Feed rate 26 fpm
- 69 lbs.
- Safety Switch
- All ball bearing

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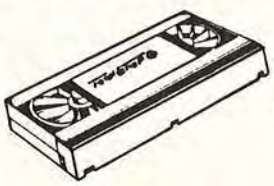

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Featured here: 18-in. Band Saw
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October 1989 • Vol. 6, No. 5 • Issue No. 31

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Introducing SmartLevel™. The First Level That Makes You Look Like a Pro.

Does it seem like your projects always come out looking almost – but not quite – professional?

There's a reason. Pros know that nothing is perfectly straight. Walls are never exactly plumb. Ceilings aren't truly level. It's due to the settling of foundations and common wear and tear.

But ordinary levels can't measure these differing angles and slopes. So pros learn how to estimate them. The result is work that looks truly professional. Cabinets that really fit. Blinds that hang straight.

The SmartLevel electronic module locks into any handhold in the SmartLevel rail–or can be used alone as a torpedo level.

Pros take years to acquire this skill. But now it can be yours in a matter of seconds. With SmartLevel from Wedge Innovations.

180 times more powerful than the bubble.

Bubble levels only measure level and plumb. SmartLevel measures 180 times more angles. And it's three times more accurate than the bubble, capable of measuring precisely to 1/10th of a degree.

Actually, most levels are even more inaccurate due to rough usage. Professionals know this. That's why many replace their levels 2 to 3 times a year.

But with SmartLevel, a push of a button automatically recalibrates its internal sensor to rebalance the system. That's why SmartLevel never needs replacing.

The professional results you've always wanted are now quick and easy.

You'll achieve professional results on the toughest projects. On walls that are no longer plumb. Floors that are no longer level. Plumbing that needs a 5% slope for drainage. Roofs that are set to different pitches. In fact, everywhere you look in your house, you'll see new uses for SmartLevel.

SmartLevel's LCD display gives you four modes of measuring to eliminate tedious conversions: in degrees for most projects, percent slope for plumbing or masonry, inches per foot of run for roofs and stairways, and a simulated bubble for simple level and plumb measurements.

And SmartLevel lets you adjust sensitivity to match your project. So you can use it for everything from rough framing, to critical jobs like leveling your stereo turntable.

Brainchild of a team of Silicon Valley engineers.

SmartLevel was created in California's Silicon Valley by a top electronic engineer (and former carpenter). Through two years of development, he and his hand-picked team created a solid-state instrument strong enough to withstand the rugged professional construction environment.

The SmartLevel module has a large, clear LCD that can read from up to ten feet away. You can use it alone as a torpedo-style level. Or snap it into any of the glove-sized handholds on the sleek SmartLevel rail. SmartLevel offers rails in 2, 4 and 6-foot lengths for more accurate readings. Rails are fashioned from polished aircraft-grade aluminum and solid nautical teak — the strongest and most durable wood available. A single 9-volt battery (not included) provides power for up to 2 years.

Proof we're on the level. Call for a risk-free 30-day trial.

SmartLevel is available exclusively from it's manufacturer — Wedge Innovations. Use it in your shop, around your house, or on a yard project. After a full 30 days, if you're not satisfied, simply return it for a prompt refund — no questions asked. Wedge also provides a full one-year warranty.

Call our toll-free line now to order: 1-800-SMARTLEVEL. We accept Visa or Mastercard. Or send a check. Act now, and take advantage of our special introductory price while supplies last.

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Sensor module w/4' teak rail	SMTR4		$129.95	$
Sensor module w/6' teak rail	SMTR6		$154.95	$
Additional Components				
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4' teak rail only	TR4		$50.00	$
6' teak rail only	TR6		$75.00	$
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			Shipping: add $5.00 per rail ordered	
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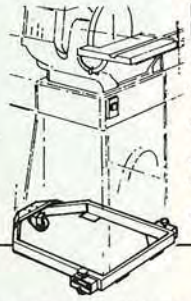

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Better Homes and Gardens®

WOOD®

THE #1 MAGAZINE FOR HOME WOODWORKERS

This issue's cover wood grain: slippery elm

OCTOBER 1989 ISSUE NO. 31

WOOD PROFILE
MESQUITE: PRIME FOR STEAK, BETTER FOR STOCK 37
Not all mesquite goes up in smoke inside the barbecue grill. Craftsmen have discovered that this Southwest tree makes excellent furniture, too.

BOY! DID WE HAVE A TOY CONTEST! 38
We tip our hats to all the generous readers who entered WOOD® magazine's first design competition. See the complete list of winners on pages 40–41.

DUCK WADDLES OFF WITH A GRAND PRIZE 42
Here's the irresistible duck that stole the hearts of our Design-A-Toy™ judges. We think you'll want to build this pull toy for holiday giving.

WHAT'S HAPPENING TO THE WORLD'S WOOD? 46
Mankind and Mother Nature have combined to slice up our planet's forests, causing alarm around the world. After capsulizing the situation, features editor Pete Stephano asks forestry experts to look to the future.

SHOP-TESTED TECHNIQUES
WORKING SMALL 50
Jim Boelling, our project builder, has gone absolutely buggy over detailing tiny masterpieces in his spare time. Now, Jim shares techniques he's developed for working in a small world.

CRAFTSMAN CLOSE-UP
FOWL LANGUAGE 56
Butch Richenbach, who grew up in Stuttgart, Arkansas—site of the World Championship Duck Calling Contest—has carted home his share of awards. Today, top-flight competitors rely on Butch's duck calls.

HOMEMADE TOOL
RIGHT-ON RIP FENCE 60
If you don't have the money in your budget for a commercially made replacement rip fence, we want to show you how to make your own fence to upgrade your tablesaw's accuracy.

DEVELOP YOUR SHOP SKILLS

HOW TO SAFELY FEED STOCK THROUGH A JOINTER 65

Whether you're a novice woodworker or you've jointed boards for decades, you'll find it worth your time to review these jointer procedures.

TOOL BUYMANSHIP

JOINTERS: MACHINES THAT GIVE YOU THE EDGE QUICKLY AND ACCURATELY 66

Shopping for a new jointer? Today, you'll find (as we did) that 6" models dominate the market. Before you buy, read about the models we tested and how they vary in quality, features, and price.

FIFTH-ANNIVERSARY SPECIAL

THE CLASSIC WOODY 72

For this occasion, our design editor created a model reminiscent of a 1930 Ford Woody. Photograph your Woody car and we'll mail you a free brass license plate.

HANDWOVEN WHATNOT BASKET 78

When Marlen Kemmet, our how-to editor, spotted this basket at a Minneapolis craft fair, he couldn't wait to build one in our shop. Amazingly, you find that you can cut all the woven pieces in your shop from solid stock.

PINT-SIZED PICTURE FRAMES 82

After you build our handy jig, you can make a batch of these tabletop frames for those school pictures kids bring home each year. Talk about a great gift idea! This is it!

TURNING PATTERN

TULIP TIME AT YOUR LATHE 84

With the help of a belt sander and files, discover how Mark Burhans, a talented Ohio woodturner, puts flare in his candle holders.

SHORT-SUBJECT FEATURES

Editor's Angle 6
Talking Back 8
Tips from Your Shop (And Ours) 14
Old Hand Ways 25
Products That Perform . . . 29
Wood Action Groups 93
Tool Industry Insider 94
Ask WOOD 98
Finishing Touches 112

		QTY.	TOTAL
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#14 Screw Eye 13/16" long	$ 3.00 / 100		
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Large Eggs 1-3/4" x 2-1/2"	$12.50 / 25		
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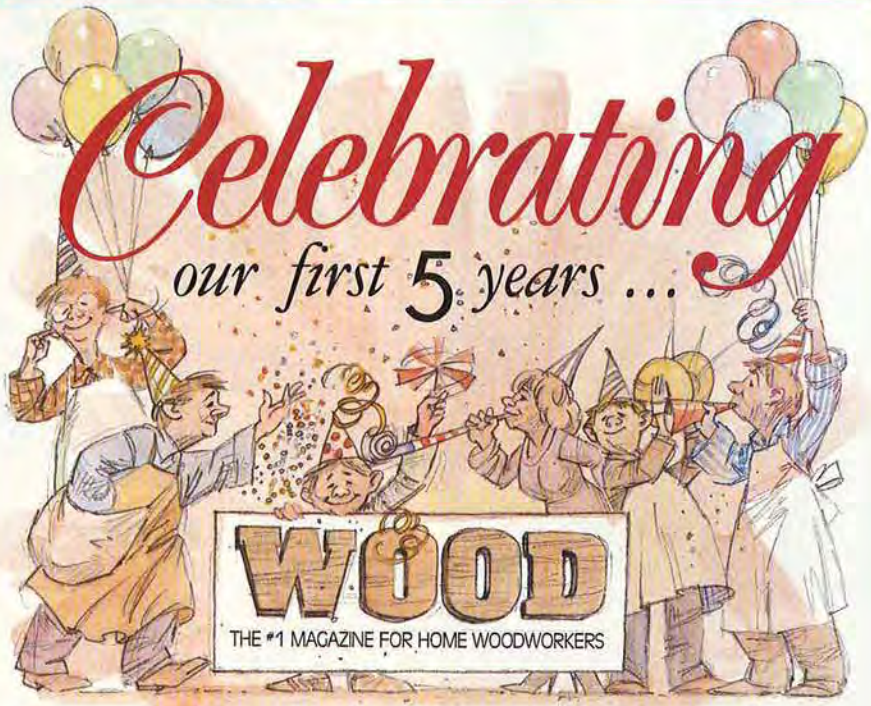

... and looking forward to serving you for many more!

Ever since it dawned on the staff and me a few months back that *WOOD*® magazine would turn five years old with this issue, we've been plotting our strategy for a blockbuster issue to mark the occasion. And now that the moment has finally arrived, we hope you enjoy the final product.

As promised, we're showcasing the winning entries in our Design-A-Toy™ competition along with instructions on how to build one of the grand-prize winners. And, be sure to take a look at Pete Stephano's fact-filled piece titled "What's Happening to the World's Wood." This timely article not only summarizes the situation as it exists around the world today, but also offers a glimpse into the future of one of man's most important renewable resources.

I'd also like to call your attention to a couple of dandy projects—both designed by our own Jim Downing—that we think you're really going to like. The first, a homemade version of the commercially available replacement rip fences, will add unbelievable accuracy to your tablesaw—for under $50. And the second, a model car reminiscent of the 1930 Ford Woody (pictured on the cover), should tickle the fancy of lots of readers.

We've also included several other great project designs, as well as our regular menu of articles covering techniques, product buymanship, and feature articles for your reading pleasure.

Oh, I almost forgot! If you're interested in seeing and learning a little more about the crew that brings you *WOOD*® magazine every two months, take a look at page 112. The gang's all there.

Enjoy!

Larry Clayton

Print this article

BOSCH
Woodworking

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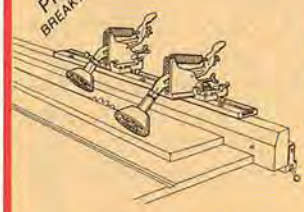

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TALKING BACK

We welcome comments, criticisms, suggestions, and even an occasional compliment. Send your correspondence to: Letters Editor, Better Homes and Gardens® *WOOD*® Magazine, 1716 Locust St., Des Moines, IA 50336.

Print this article

U.S., CANADIAN DOOR OPENS WIDER

Our growing Canadian readership occasionally asks questions about purchasing woodworking tools and supplies in the U.S. Until this year, Canada collected a 9 to 10 percent tariff on U.S.-made goods crossing the border. U.S. Customs, on the other hand, collected a 4 to 5 percent tariff on Canadian-made goods headed south. The recently enacted Canada-U.S. Free Trade Agreement will phase out tariffs, including most woodworking-equipment duties, by Jan. 1, 1993; the first 20 percent reduction occurred Jan. 1 of this year. The agreement affects only goods made in Canada and the U.S.; a set of German-made chisels, for example, would still be subject to tariffs.

This new trade agreement should be good news for woodworkers on both sides of the border. But, Canadians should keep in mind that the fluctuating exchange rate could add about 18 percent to their purchase. And, they may be subject to federal and provincial taxes on their U.S. purchases.

WOOD magazine readers Sherry Sanne of Winnipeg and D. L. Myhre of Lethbridge, Alberta, asked if Canadians can take advantage of free pattern offers in the magazine. You bet! If Canadians—or any foreign residents—include an international reply coupon with your self-addressed envelope, *WOOD* magazine will send you any free pattern that strikes your fancy.

Many firms advertising in *WOOD* magazine do ship to Canada and foreign countries. They must declare the contents and value of the order on a customs declaration form affixed to the outside of the shipping box. "We get thousands of orders each year from Canada," says Glenn Docherty at Albert Constantine & Son. "But before we ship, we let them know what the additional postage will be. Canadians then pay duty at their post office. United Parcel Service also will collect duties on orders they deliver in Canada."

"We charge $4 extra for each Canadian order," says David Draves of Woodcraft, "to cover the additional postage and paperwork. Recently, we've noticed an increase in catalog interest from Canada—perhaps because of attention to the new trade agreement."

47-YEAR-OLD MYSTERY SOLVED

A feature article in the February issue of *WOOD* magazine—"Paldao, A Truckful of Horrors"—caught

Continued on page 10

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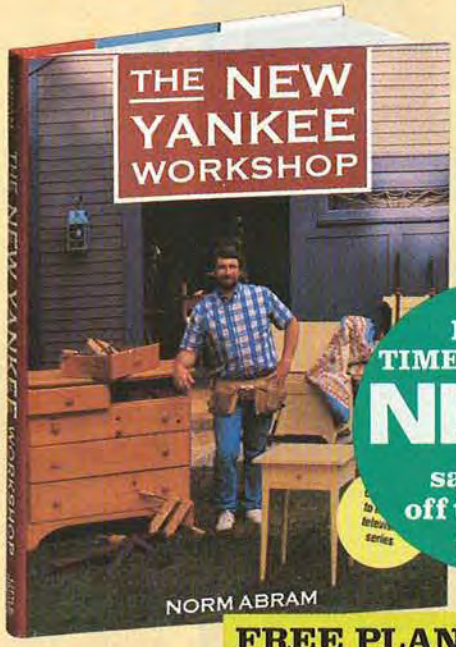

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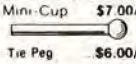

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TALKING BACK

Print this article

Continued from page 8

my attention. This may be the wood that I've wondered about and inquired about since 1942. Where did I see this tree? On Guadalcanal in the Solomon Islands with the First Marine Division. The trees I saw were of great height and diameter. I never saw one in open ground, but always in dark, heavy swamps. The article said the things I believe to be buttresses started outward from the tree from a height of about 30 feet. This 3" or 4" wall would twist and wind away from the tree. I don't know how many of these walls there were on each tree, but I do know that you could walk all around the trunk of the tree and be completely concealed.

—Maj. Harry Campbell, Springhill, Fla.

Major, we inadvertently solved your 47-year old mystery that originated on Guadalcanal. The tree you remember, and the supports called buttresses, was no doubt paldao (Dracontomelum dao), or one of its close family members. The tree's great natural range includes the Philippines and New Guinea, as well as most of the Southwest Pacific. Besides its common name of paldao, the wood trades under the names sengkuang, New Guinea walnut, lamio, dao, damoni, dorea, loup, and New Guineawood, according to the U.S. Forest Service's Forest Products Laboratory in Madison, Wisconsin. Paldao grows to about 120', and often has a straight trunk of 80' above the buttresses. Woodworkers prize the walnut-like wood, as our story told you, for paneling and furniture.

OF MILLIMETERS, MILS, AND INCHES

How thick was that Mylar? In February, you said the DuPont double-matte Mylar was 3 mm thick. Now in the June issue, you say its .003 mm. I believe you really mean 3 M, which stands for *mils*. Circular mils is a term used by the electrical and plastics industries, and normally shortened to just mils. A sheet of 3 mil plastic equals .003 of an inch in thickness. Many people get their m's and mm's confused, as a result of our metric conversion.

—E.W. Bingham, Portland, Ore.

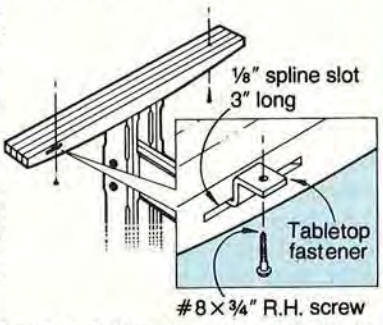
Bing, you were the first of a half dozen sharp-eyed readers to straighten us out on mils. Thomas Nelson Jr. of DuPont confirmed the facts as you state. Case closed—we hope.

THE CASTERS ARE EXTRA

Powermatic product manager Robert Alsup informs us that retractable casters listed as standard equipment on the new model 63 Artisan 10" tablesaw are a $32 optional accessory. The saw, mentioned in the June 1989 "Tool Industry Insider," lists for $650.

GLAD YOU THOUGHT OF THAT

I have a suggestion on how to improve the trestle table featured in your April 1989 issue. Fasteners like the one shown at *right* allow for the different wood movement of the tabletop and the table supports.



—David G. Schwenker, Portsmouth, Va.

*You have a good idea, David. One bracket at each end of the table allows the natural expansion and contraction of wood to continue. Inquire at your local hardware store for a ¾" Stanley tabletop fastener (*part number *1910).*

SCRAPING AWAY FOR A BETTER TOOL

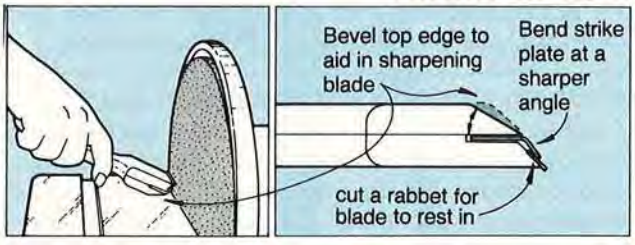
I am delighted with the scraper presented in the April 1989 issue, and wasted no time in getting one made. In the process, I made a few changes that I believe made a good tool even better.

First, I rabbeted a shoulder in the blade-mounting surface. This stop positions the blade and prevents it from slipping when applying pressure.

Since I didn't happen to have a solid-brass strike plate, I substituted a brass-coated steel plate. The results please me, since the steel plate is stiffer, doesn't spring away when releasing the blade, and doesn't distort when tightening the clamp nut. Please note that I changed the bend angle to apply clamping pressure where it's most effective.

Instead of a ½" round-over on the top, I intentionally cut it flat to provide a surface perpendicular to the desired rake angle on the edge of the blade. By resting the scraper on this surface, I can quickly produce a straight cutting edge on a disc sander.

—Tom Rose, Los Angeles



Once again, Tom, you have insightful comments. Since publishing the project, Jim Downing, our design editor, has discovered that solid carbide blades for hand-held power planers work even better than the hacksaw blades we originally suggested. Jim snapped off about 1" from blades he picked up at a local Black & Decker store.

Continued on page 12

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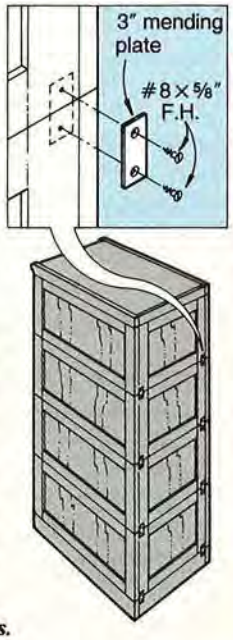
TALKING BACK

Continued from page 11

STRAPPING DOWN THOSE FILE-CABINET DRAWERS

I built the two-drawer file cabinet in the February 1988 issue and found the instructions and illustrations easy to follow.

However, I'd like to point out a hazard connected with all filing cabinets and particularly with this one. When the top file drawer is loaded and fully extended, the file may tip forward. (Most commercial cabinets have a device that allows only one drawer to open at a time.) Since the individual components are not tied together, this could be even more dangerous if three or four drawers are stacked. I solved the problem by bolting the sections together with metal angle brackets.



—Bob Vanderbeyden, Green Bay, Wis.

Bob, you're right—we should have foreseen this as a potential problem. Here's another solution: We recommend ½x3" brass mending plates (Stanley part number CD5350) to secure the pieces as shown in the illustration above.

BIGGER CHESTNUT TREES

Your Wood Profile article on page 37 of the June 1989 issue indicates that chestnut trees "measured 5–6' around the trunk." As you no doubt know, 5–6' was the diameter.

—Ty Baldwin, Richmond, Ky.

Ty, you certainly know an American chestnut tree when you see one. Of course, we meant a 5–6' diameter, not circumference as stated. After all, these trees were BIG, and plenty of them grew in Kentucky.

BOWLED OVER, POLYCHROMATICALLY

I was impressed by your fine article on stack-laminated bowls in the April 1989 issue. Your readers may want to know that the correct name for this kind of turning is polychromatic assembly. Two books have been published on this subject. I recommend *Polychromatic Assembly for Woodturning,* by Emmett and Cyril Brown (Linden Publishing Co, 1982). The book includes plans for a beautiful bowl with a 12-point star. I've searched unsuccessfully for years for another book on the subject, *The Art of Polychromatic and Decorative Turning,* written by George and Berthod Audsley in 1916.

—Robert Walter, Baltimore

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- A chance to be selected as the Top Shop Tip winner for the issue. This issue's winner will receive a Makita model 3601B D-handle router as shown at *right*.

We try not to use shop tips that have run in other magazines, so please send your tip to only one magazine. We cannot return shop tips. Mail your tips, address, and daytime phone number to:

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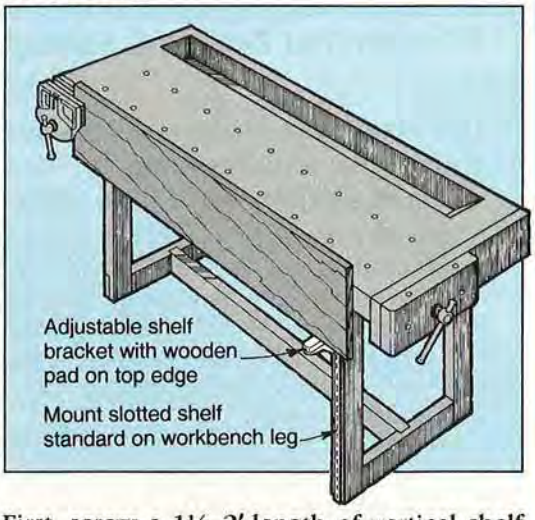
BRACKET SUPPORTS LONG STOCK AT WORKBENCH

Many workbenches—homemade and commercial models alike—don't incorporate features to support long pieces protruding from the vise. As a result, it's necessary to scrounge around for an acceptable temporary support or go look for someone to serve as a willing assistant. There has to be an easier way!



TIP: Here's an inexpensive solution: modify and install a readily available shelf bracket on your workbench. First, screw a 1½–2'-length of vertical shelf standard to one leg of your workbench as shown *above*. Then, grab a metal shelf bracket and for the protection of your workpieces face it with a grooved piece of wood, glued in place with epoxy. You may wish to make several brackets of different sizes and configurations to handle special situations. Adjust the bracket up and down for various stock widths. This setup gives you a sturdy and economical support system.

—Tom E. Moore, Madison, Va.

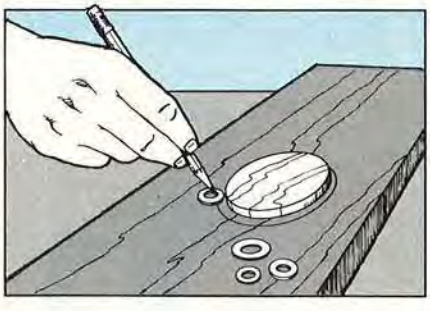
For his winning tip, Tom receives the Makita model 3601B 1⅜-hp, fixed-base router shown at *left*.

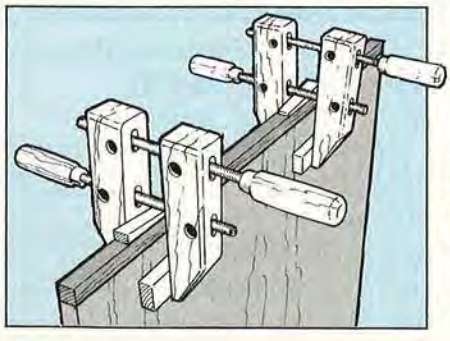
ROLL ALONG EASILY WITH TEMPLATE ENLARGEMENTS

Enlarging templates by small increments—like ¼ or ½"—can be a real pain, especially when you're trying to increase the dimensions of a curved or irregularly shaped object. Sometimes, you need to draw template offset lines that match a router guide bushing. Here's a solution utilizing parts on hand.

TIP: Use a flat metal washer as a spacer between the edge of the template and the point of your pencil as illustrated at *right*. Washers come in many different sizes, giving you a wide choice in enlarging capabilities. Maintain even pressure on the pencil as you draw.

—From the WOOD magazine shop





WOODWORKER'S CLAMPS GLUE EDGES, TOO

You can't top edge clamps for edge-gluing projects, but like all quality tools, a fistful of them represents a tidy investment. Without denting your wallet, wouldn't it be nice if clamps you already own would work for this task?

TIP: Call your woodworker's clamps into action for those occasional edge-gluing jobs by using them in combination with homemade wooden wedges. After fitting together the glued workpieces, tighten the clamps in place as shown at *left* and tap wedges in place for the desired lateral pressure. Suitably sized C-clamps work quite well in this arrangement, too.

—From the WOOD magazine shop

Continued on page 16

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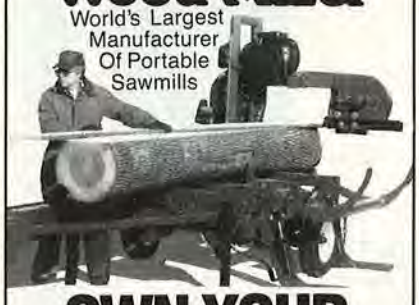

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TIPS FROM YOUR SHOP (AND OURS)

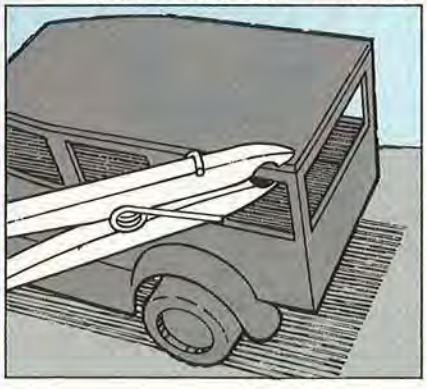
Continued from page 14

CLOTHESPINS BECOME MIGHTY MICRO-CLAMPS

Putting together tiny projects such as dollhouse furniture, wooden models, or jewelry, can get awfully frustrating, especially when you're gluing intricate parts.

TIP: Reshape spring-activated wooden clothespins into miniature clamps as shown *below*. You can tailor their tips to fit different situations. The softwood pins won't damage delicate surfaces.

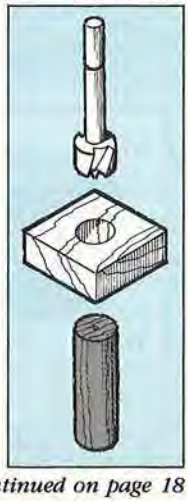
—John Monaghan, Goleta, Calif.



A DRILL BIT FINDS DEAD CENTER OF A DOWEL

Locating the center of a wooden dowel can be a hit-or-miss proposition if you try to do it with a straightedge and a pencil. Typically, the smaller the dowel, the greater the chance for missing the middle.

TIP: Hit the center by using a Forstner bit of the same diameter as the dowel to bore a hole through a block of scrapwood. Then, insert the dowel into the hole on one side of the block and the bit on the other side. Press in slightly as you twist the bit a few times to mark the center of the dowel.



—From the WOOD magazine shop

Continued on page 18

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TIPS FROM YOUR SHOP (AND OURS)

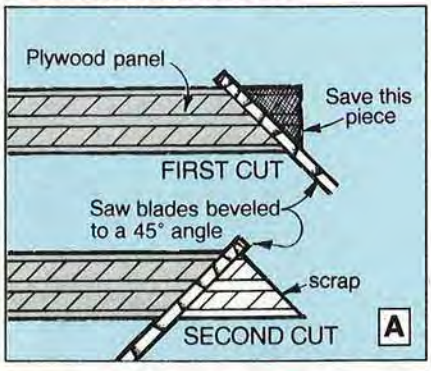
Continued from page 16

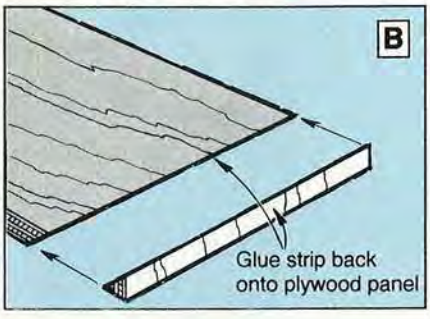
HIDE EDGES IN PLYWOOD AND OTHER MATERIALS

Panels constructed of hardwood-faced plywood have pretty faces, but the laminated edges simply are not presentable on cabinetry or other projects. Veneering is a possible solution—providing you have the materials and tools to do the job.

TIP: To disguise the plywood layers, cut beveled strips from the material with your tablesaw or radial-arm saw set at 45° as shown in drawing *A*. Make a second cut perpendicular to the first one as shown and discard the resulting scrap. Finally, glue the first strip in place as shown in drawing *B*. This procedure also extends the face-grain pattern onto the edge. Use this technique to disguise freshly sawed edges on weathered barn boards used for picture frames.

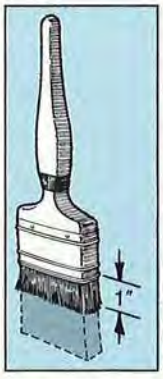
—Howard Pieplow, West Allis, Wis.





GIVE TOUGH STRIPPING PROBLEMS THE BRUSH-OFF

When refinishing furniture, working the stripper into tight corners and finely detailed work can prove hard work. Brass brushes help, but cost money, too.



TIP: Scrub away the loosened finish from intricate carvings, deep grain, and other hard-to-get areas with an old paintbrush. First, cut off the bristles to a length of 1" to make them stiff enough to work nicely. For best results, generously dab on the stripper without overbrushing it during application.

—Mark Ceola, Fayetteville, Ark.

Continued on page 21

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71K26.02 Saw Setting Gauge $16.95

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D / Super-Hard, Pre-Sharpened Scrapers Keep Their Edge Longer

Most scraper blades are sheared from steel hardened to Rc 38-42. This makes them fairly easy to file, stone and burnish. The hook, however, wears quickly in hard use. These are sheared from spring steel hardened to a Rc 48-51. Both edges are surface ground to a sharp, square 90°.

The prepared edge saves you filing and stoning initially and the extra hardness lets you use the scrapers longer between burnishings. Supplied with edge guards, which you should always replace after use. Comes in a set of 4: .015", .025", .035" and .042." thick.

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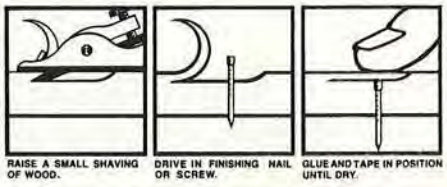
44K01.03 Nailer Plus Chisel $14.95



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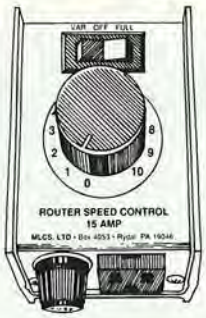

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FEATURES:

- **Speed Adjustable from Full Speed to 0 RPM**
- **Full Horsepower and Torque at All Speeds**
- **Go Back and Forth from Any Pre-Set Speed to Full Speed at the Flip of a Switch**
- **Works with All Routers 3 HP or Less**
- **120V 15 Amp**
- **Gives Your Router a Feature Only Available on Routers Costing Hundreds of Dollars!**

- *Less Tear Out*
- *Stops Burning*
- *Feed at Comfortable Rate*
- *Better, Safer Results with Large Diameter Bits*
- *Less Wear on Bits*
- *Less Noise and Softer Starts at Lower Speeds*

EASY TO USE - Simply plug in Speed Control and plug your router into the Speed Control - turn dial for best results. (Speed Control has a clip that can be worn on your belt or hung on wall or left loose.)

- Reduces speed electronically without reducing torque; electronic feed-back maintains speed by increasing voltage to motor as load increases.

CARBIDE TIPPED ROUTER BITS PROFESSIONAL PRODUCTION QUALITY *GUARANTEED*

WHEN ORDERING ANY THREE OR MORE DEDUCT $1.00 EACH. ALL PRICES ARE POSTAGE PAID

ITEM NO.	BEST CUT BEST PRICE	DESCRIPTION	ANGLE/DEPTH/RADIUS CIRCLE DIAMETER	LARGE DIA.	CUTTING LENGTH	SHANK SIZE	PRICE
#490		1¼" **Classical**		1¼"	5/8"	¼"	$25.00
#491		1½" Classical		1½"	¾"	¼"	$25.00
#792		1½" Classical		1½"	⅞"	½"	$25.00
#231		5/32" **Roman Ogee**	5/32" R	1¼"	15/32"	¼"	$17.00
#232		¼" Roman Ogee	¼" R	1½"	¾"	¼"	$18.00
#661		¼" Roman Ogee	¼" R	1½"	¾"	½"	$21.00
#340		⅛" **Cove**	⅛" R	5/8"	½"	¼"	$12.00
#341		¼" Cove	¼" R	1"	½"	¼"	$13.00
#342		⅜" Cove	⅜" R	1¼"	9/16"	¼"	$14.00
#343		½" Cove	½" R	1½"	5/8"	¼"	$15.00
#644		¾" Cove	¾" R	1⅞"	¾"	½"	$28.00
#350		⅛" **Round Over**	⅛" R	¾"	½"	¼"	$11.00
#351		3/16" Round Over	3/16" R	⅞"	½"	¼"	$11.00
#230		¼" Round Over	¼" R	1"	½"	¼"	$12.00
#354		⅜" Round Over	⅜" R	1¼"	5/8"	¼"	$15.50
#355		½" Round Over	½" R	1½"	¾"	¼"	$17.00
#656		¾" Round Over	¾" R	2"	⅞"	½"	$21.00
#657		1" Round Over	1" R	2½"	1"	½"	$33.00
#370		⅜" **Rabbeting**	⅜" Deep	1¼"	½"	¼"	$14.00
#670		⅜" Rabbeting	⅜" Deep	1¼"	½"	½"	$14.00
#366		⅛" **Slot Cutter**	⅜" Deep	1¼"	⅛"	¼"	$14.00
#368		¼" Slot Cutter	⅜" Deep	1¼"	¼"	¼"	$14.00
#403		⅜" **Dovetail**	9 degree	⅜"	⅜"	¼"	$ 7.50
#405		½" Dovetail	14 degree	½"	½"	¼"	$ 8.50
#409		¾" Dovetail	14 degree	¾"	⅞"	¼"	$10.50
#709		¾" Dovetail	14 degree	¾"	⅞"	½"	$10.50
#402		⅜" Dovetail	8 degree For	⅜"	½"	¼"	$12.00
#404		½" Dovetail	8 degree Leigh	½"	13/16"	¼"	$12.00
#708		1 1/16" Dovetail	8 degree Jigs	1 1/16"	1"	½"	$17.50

ITEM NO.	BEST CUT BEST PRICE	DESCRIPTION	ANGLE/DEPTH/RADIUS CIRCLE DIAMETER	LARGE DIA.	CUTTING LENGTH	SHANK SIZE	PRICE
#415		¼" **Core Box**	round nose	¼"	¼"	¼"	$10.00
#416		⅜" Core Box	round nose	⅜"	⅜"	¼"	$11.00
#417		½" Core Box	round nose	½"	1 1/32"	¼"	$14.00
#418		¾" Core Box	round nose	¾"	5/8"	¼"	$15.00
#719		1" Core Box	round nose	1"	¾"	½"	$18.00
#470		¼" **Straight**	plunge cutting	¼"	¾"	¼"	$ 7.00
#471		5/16" Straight	plunge cutting	5/16"	1"	¼"	$ 7.00
#472		⅜" Straight	plunge cutting	⅜"	1"	¼"	$ 7.00
#474		½" Straight	plunge cutting	½"	1"	¼"	$ 7.00
#775		½" Straight	plunge cutting	½"	2"	½"	$14.00
#476		9/16" Straight	plunge cutting	9/16"	1"	¼"	$ 7.00
#478		5/8" Straight	plunge cutting	5/8"	1"	¼"	$ 8.00
#479		¾" Straight	plunge cutting	¾"	1"	¼"	$10.00
#781		1" Straight	plunge cutting	1"	1½"	½"	$12.00
#500		⅜" **Flush**	**Trimming**	⅜"	½"	¼"	$ 7.00
#502		½" Flush	Trimming	½"	½"	¼"	$ 7.50
#503		½" Flush	Trimming	½"	1"	¼"	$ 8.50
#804		½" Flush	Trimming	½"	1 3/16"	½"	$ 9.00
#545		**Tongue & Groove**	Straight	1⅝"	1"	¼"	$30.00
#845		Tongue & Groove	Straight	1⅝"	1"	½"	$30.00
#546		Tongue & Groove	Wedge	1 3/16"	1"	¼"	$30.00
#846		Tongue & Groove	Wedge	1⅝"	1"	½"	$30.00
#450		⅛" **Beading**	⅛" R	¾"	½"	¼"	$11.00
#451		3/16" Beading	3/16" R	⅞"	½"	¼"	$11.00
#233		¼" Beading	¼" R	1"	½"	¼"	$13.00
#453		5/16" Beading	5/16" R	1⅛"	½"	¼"	$14.00
#454		⅜" Beading	⅜" R	1¼"	5/8"	¼"	$15.50
#455		½" Beading	½" R	1½"	¾"	¼"	$17.00
#375		**45 degree**	45 degree	5/8"	1½"	¼"	$15.00
#676		**Chamfer**	45 degree	⅞"	1⅞"	½"	$23.00

New 24-page catalogue now available, featuring hundreds of bits.

MAKE BEAUTIFUL RAISED PANEL DOORS . . . WITH YOUR 1/4" ROUTER!

SET ALSO AVAILABLE IN ½" SHANK - $79.95 - Item #852

SAVE 55%

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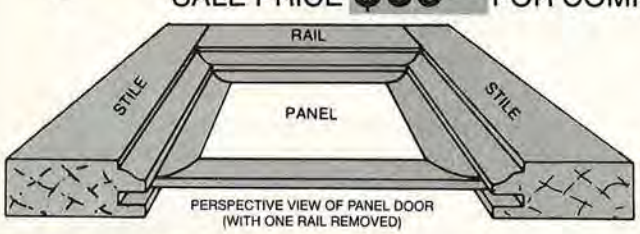

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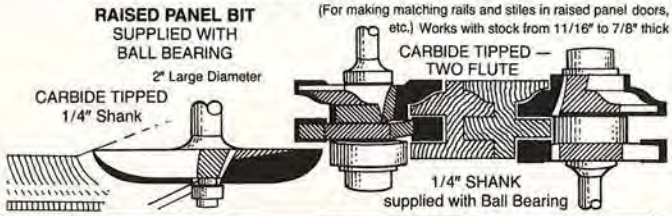

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TIPS FROM YOUR SHOP (AND OURS)

Continued from page 18

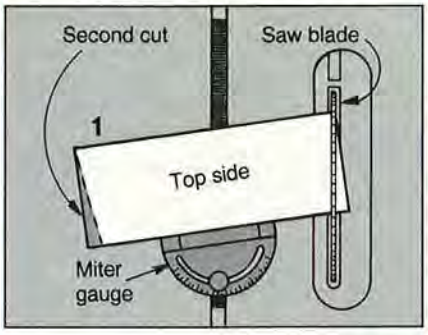
CHECK YOUR MITER GAUGE POINTER FOR ACCURACY

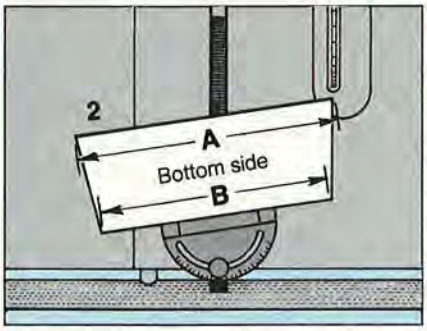
Most tablesaw miter gauges have an adjustable pointer for setting the gauge. Accidentally dropping the miter gauge may knock the pointer out of alignment, or vibration can loosen the setscrew so you no longer get a correct reading at the tip of the pointer.

TIP: To check the trueness of your miter gauge, set it for a square cut and crosscut a short length of 6"-wide board, holding it snugly against the miter gauge as shown in drawing 1. We exaggerated an out-of-square cut for clarity.

Now, flip the board end for end and make a similar cut. If the gauge is set correctly, both edges of the board will be the same length ("A" and "B" shown in drawing 2 would be equal). A difference of 1/16" between "A" and "B" on a 6" wide board indicates the angle is 0.3 degrees out of square. The wider the board you use, the more accurate the measurement becomes. Correct misalignment by resetting the gauge, adjusting the pointer, and making new crosscuts to check the adjustment.

—F.V. Chmielowiec, Boulder, Colo.





Continued on page 22

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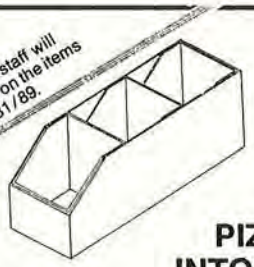

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ITEM#	SIZE/DESCRIPTION	/100
16001	Shaker Pegs 3.5"	15.00
16006	Oak Shakers 3.5"	22.00
16101	Mug Pegs 3.375"	24.00
18031	Lg. Candle Cup	17.00
18036	Lg. Oak Candle Cup	7.00/20
18091	Brass Inserts	9.00

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13104	1/2" Wood Ball	5.90
13106	3/4" Wood Ball	7.90
13108	1.0" Wood Ball	10.90
13112	1.5" Wood Ball	29.00
13204	1.0" Wood Knob	18.90
13206	1.5" Wood Knob	25.90
13208	2.0" Wood Knob	31.90
S1300	Screws for Knobs	3.00

WHEELS

10812	1.5" dia. 1/4" hole	10.50
10914	1.75" dia. 1/4" hole	15.00
11216	2.0" dia. 3/8" hole	19.00
11218	2.25" dia. 3/8" hole	22.00
11220	2.5" dia. 3/8" hole	7.50/20
11222	2.75" dia. 3/8" hole	9.50/20

AXLE PEGS

ITEM#	SIZE	/100
12001	7/32" x 1-3/8"	4.10
12004	11/32" x 1-5/8"	7.40
12005	11/32" x 2-3/8"	9.00

HARDWOOD BUTTONS

ITEM#	SIZE	/100	/500
14013	3/8"	1.75	7.50
14014	1/2"	1.75	8.00
14016	3/4"	4.50	20.70
14017	7/8"	4.65	21.90
14018	1.0"	6.30	29.70

OAK BUTTONS

14043	3/8"	3.70	15.50
14044	1/2"	3.80	16.00

WALNUT BUTTONS

14073	3/8"	4.70	22.50
14074	1/2"	4.80	23.50

HARDWOOD FLAT HEADS

14213	3/8"	1.90	8.00
14214	1/2"	1.90	8.00

HARDWOOD OVAL HEADS

14413	3/8"	1.90	8.00
14414	1/2"	1.90	8.00

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14614	1/4"	2.00	9.00
14615	5/16"	2.10	9.50
14616	3/8"	2.20	9.50
14617	7/16"	2.60	11.70
14618	1/2"	3.10	14.40

MULTI-GROOVED PINS - 2"

14814	1/4"	1.90	8.50
14815	5/16"	2.00	9.00
14816	3/8"	2.00	9.25

HARDENED STEEL SCREWS

ITEM#	SIZE	/100	/1000
S6260	#6 1.0"	1.25	10.25
S6261	#6 1.25"	1.40	11.50
S6262	#6 1.625"	1.80	15.00
S6263	#6 2.0"	2.40	19.75
S6264	#7 2.25"	2.75	22.75
S6265	#8 2.5"	4.30	35.50
S6266	#8 3.0"	4.55	37.25

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If you're ready to cut it with the best of them, call toll free for the name of your nearest Delta dealer. Delta International Machinery Corp., 800/438-2486 (in PA, 800/438-2487).

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TIPS FROM YOUR SHOP (AND OURS)

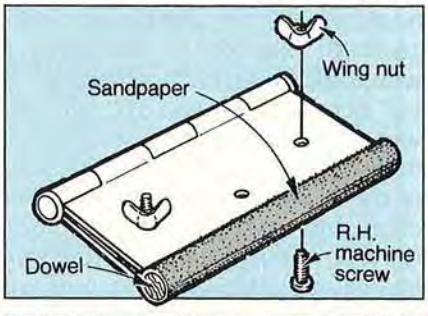
Continued from page 21

A GADGET FOR SANDING CONCAVE SURFACES

Sanding wooden moldings on furniture and other concave surfaces with hand-held sandpaper often results in skinned fingers and a hit-and-miss smoothing job.

TIP: Gather up an old door hinge, a short length of the appropriate-diameter dowel, a piece of sandpaper for the desired grit, and a couple of round-head machine screws with wing nuts. Cut the dowel to the correct length and the sandpaper to the appropriate dimensions and assemble as shown *below*. Cutting additional dowel pieces of varying diameters gives your handy little sander extra flexibility.

—Fred A. Race, Euclid, Ohio



MORE SUPER TIPS FROM TOP WOODWORKERS

You'll find more shop tips in this issue of *WOOD* magazine:

- How do you bandsaw the head of a bird or animal to a rough form prior to rounding and smoothing it? Try our procedure on page 45.
- You can try your hand at several methods to make usable stock from scrap. See the article on working small beginning on page 50.
- We've found a way to darken grooves in wood turnings for contrasting accents. See page 58.
- If you would like to fashion your own turning tools, see page 58 for a source of good steel.
- See the basket project on page 78 for a way to safely cut thin strips on the side of a tablesaw blade opposite the fence.

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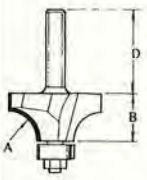
SY4-8	5/16	$6
SY4-10	3/8	$6
SY4-12	1/2	$8
SY4-1 6	5/8	$10
SY4-19	3/4	$10
SY4-25	1	$12
SY4 = 1/4" SHANK SY8 = 1/8" SHANK		
SY8-6	1/4	$6
SY8-8	5/16	$6
SY8-10	3/8	$6
SY8-12	1/2	$8
*SY8-12 (2")	1/2	$15
SY8-16	5/8	$10
*SY8-16 (2-1/2")	5/8	$15
SY8-19	3/4	$10
*SY8-19 (2")	3/4	$15
SY8-25	1	$12
SY8-30	1-1/4	$12
SY8-35	1-3/8	$15
SY9-40	1-5/8	$18

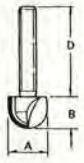
* LONGER CUTTING EDGE

Roundover



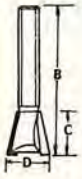
PART NO.	A	PRICE
S502Y	1/16R	$11
S504Y	1/8R	$11
S506Y	3/16R	$11
S508Y	1/4R	$12
S510Y	5/16R	$13
S512Y	3/8R	$15
S516Y	1/RR	$16
*S516Y-1/2	1/2R	$16
*S520Y-1/2	5/8R	$16
*S524Y-1/2	3/4R	$20
*S528Y-1/2	7/8R	$34
*S523Y-1/2	1R	$34
*S536Y-1/2	1-1/4R	$40

Core Box



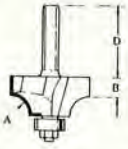
PART NO.	A	PRICE
S408	1/4	$10
S412	3/8	$10
S416	1/2	$12
S420	5/8	$14
S424	3/4	$15
*S424-1/2	3/4	$15
*S423-1/2	1	$18
*S450-1/2	1-1/2	$30

Dovetail



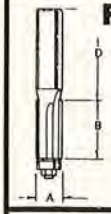
PART NO.	D	PRICE
802	3/8	$7
804	1/2	$7
*804-1/2	1/2	$7
806	9/16	$8
810	3/4	$9
*810-1/2	3/4	$9
*812-1/2	1	$12

Beading



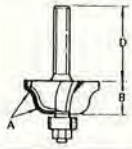
PART NO.	A	PRICE
S602Y	1/16R	$11
S604Y	1/8R	$11
S606Y	3/16R	$11
S608Y	1/4R	$12
S610Y	5/16	$13
S612Y	3/8R	$15
S616Y	1/2R	$16
*S616Y-1/2	1/2R	$16
*S624Y-1/2	3/4R	$20

Flush Trimming



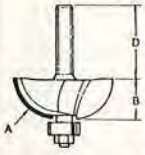
PART NO.	A	PRICE
S8012Y	3/8	$7
S8016Y	1/2	$8
*S8016Y-1/2	1/2	$8
S8020	5/8	$10
*S8020-1/2	5/8	$10

Roman Ogee



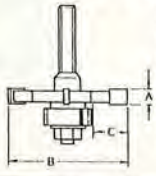
PART NO.	A	PRICE
S5705Y	5/23	$16
*S5705Y-1/2	5/32	$16
S5708Y	1/4	$18
*S5708Y-1/2	1/4	$18

Cove Bits



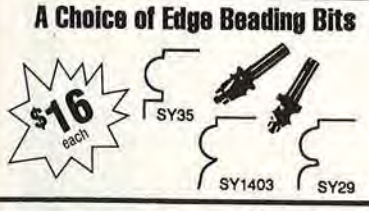
PART NO.	A	PRICE
S702Y	1/16	$12
S704Y	1/8	$12
S706Y	3/16	$12
S708Y	1/4	$13
S710Y	5/16	$14
S712Y	3/8	$15
S716Y	1/2	$16
*S716Y-1/2	1/2	$16
*S724Y-1/2	3/4	$28

Slot Cutter – 4 Flutes



PART NO.	A	PRICE
SY7002	1/8	$20
*SY7002-1/2	1/8	$20
SY7004	5/32 (4mm)	$22
*SY7004-1/2	5/32 (4mm)	$22
SY7006	3/16	$22
*SY7006-1/2	3/16	$22
SY7008	1/4	$24
*SY7008-1/2	1/4	$24

A Choice of Edge Beading Bits



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SY-1212-4 3/4" $32.95
SY-1212-5 1" $35.95
SY1212-6 1-1/2" $36.95
SY-1212-8 2" $59.95

Bead

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SY-1224-2 3/8" $26.95
SY-1224-3 1/2" $28.95
SY-1224-4 3/4" $32.95
SY-1224-5 1" $35.95

Flute

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SY-1223-2 3/8" $26.95
SY-1223-3 1/2" $28.95
SY-1223-4 3/4" $32.95
SY-1223-5 1" $35.95

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SY-1225-2 3/8" R $26.95
SY-1225-3 1/2" R $28.95
SY-1225-4 3/4" R $32.95
SY-1225-5 1" R $35.95
SY-1225-6 1-1/4" R $49.95

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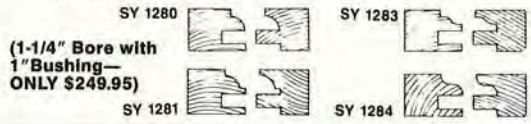

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On The Anniversary Of Three Centuries Of Woodworking Writing

"Began Jan. 1. 1677. And intended to be Monthly continued."

Joseph Moxon

And so began the revelation of the woodworker's secrets that, in part, became Englishman Joseph Moxon's *Mechanick Exercises or The Doctrine of Handy-Works*. The volume not only was the first real how-to book, it was also the first book published in installments. It was the predecessor to today's how-to magazines.

All who enjoy reading, and writing, about woodworking owe Joseph Moxon. His influence lies like DNA at the heart of all how-to writing. Publishers have adapted his 300-page book for centuries, but, like Shakespeare and homecooking, nothing beats the original. Moxon is the wood-writer's insightful ancestor, and his long out-of-print work rates acquaintance.

FROM TOOL BUYMANSHIP TO SHOP TIPS

Keeping the horse ahead of the cart, Moxon began his book with a discourse on blacksmithing, figuring that woodworkers depended on the smith for their tools. He then began the woodworking section by examining the tools, telling how to "use them with more ease and delight, and make both quicker and nearer Work with them."

The woodworker of Moxon's day could purchase a variety of sophisticated hand and foot-powered tools. But, as ever, the buyer had to be careful. Many of the handsaws of his time were made from hammer-hardened iron rather than of fine steel. The hammering and grinding of the iron produced saws of uneven quality, and Moxon—in true buymanship fashion—told his readers how to avoid getting stuck with a bad one. This was three centuries ago, but watch anyone shopping for saws at the hardware store today, and sooner or later, you will see them perform Moxon's final test. They will flex the saw in their hands, as have millions before them, knowing that "if it bend into a regular bow all the way, and be stiff, the Blade is good."

No woodworking book or magazine would be complete without its share of shop tips. When he gets around to hammers, editor Moxon

Continued on page 26

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WOODWORKING WRITING *Continued from page 25*

digresses from shop tip to shop trick: "A little trick that is sometimes used among some (that would be thought cunning Carpenters) is to privately touch the Head of the Nail with a little Ear-wax, and then lay a Wager with a stranger to the Trick that he shall not drive that Nail up to the Head with so many blows. The stranger thinks that he shall assuredly win, but does assuredly lose; for the Hammer no sooner touches the Head of the Nail, but instead of entering the Wood it flies away, notwithstanding his utmost care in striking it down-right."

Most of *Mechanick Exercises*, though, bestows solid instruction on basic technique. Moxon told his readers how to accurately dimension stock and cut a mortise-and-tenon joint. The pioneer editor and publisher covered basic woodturning, beginning with building a lathe and ending with a finish of beeswax pressed against the spinning work. Then, setting "a gloss on it with a very dry Wollen rag, lightly smear'd with Sallad Oyl."

KNOWING YOUR CRAFT, AND YOUR READERS

Moxon knew what still makes home craftsmen tick. He wrote shamelessly about building things that have no purpose except to "make others that know not the way how it is done to Admire their skill." One such feat was turning a free-moving ivory cube within an ivory sphere. He mentioned that the reader must make the cube large and the hole in the sphere small "to make this Thing more Admirable to the ignorant Spectator."

Projects aside, the first how-to writer knew the limits of book-learning. "This Craft of the Hand must be acquired with some continued Use and Practice, which will better inform your Judgement what Errors you may be subject to commit, than many words."

Moxon's words continue, however, to this day and beyond. On this, the occasion of the fifth anniversary of *WOOD*® magazine, we'd like to tip our hats to Joseph Moxon. After all, he knew 300 years ago what we're attempting to do: To show you, our woodworking reader, "How pleasant and healthy this their Diversion is."

For information on the availability of a reprint of Joseph Moxon's book, write: The Early American Industries Assoc., c/o John S. Kebabian, 2 Winding Lane, Scarsdale, NY 10583.

By Roy Underhill
Master housewright at Colonial Williamsburg and host of the popular PBS series The Woodwright's Shop, *Underhill is also an author and lecturer.*

Illustration: Jim Stevenson

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BHWM-989

Announcing the winners of the 1989 WOOD® Magazine Design-a-Toy™ Competition.

1989 WOOD® DESIGN-A-TOY™ AWARD WINNERS

HOME HOBBYIST: NO MOVABLE PARTS

Grand Prize:
Alvin J. Curtis, Oshkosh, WI

First Prize:
David Cartwright, Arlington Heights, IL

Special Citations:
Ronald Busdiecker, Euclid, OH
Sam Roberts, Roseburg, OR
Merle Halter, North Platte, NE
Donald Flanagan, Shell Knob, MO
Robert E. Sweet, Toledo, OH

HOME HOBBYIST: MOVABLE PARTS

Grand Prize:
Robert W. Sanders, St. Marys, GA

First Prize:
Harold E. Geiselman, Canton, OH

Special Citations:
Bill Kaiser, Huntingburg, IN
Mike Gradeless, Columbia City, IN
Brian W. Anderson, Waseca, MN
Larry Groninger, Reevesville, PA
Rene Knetsch, Oklahoma City, OK

SCHOOL AGE: MOVABLE PARTS

Grand Prize:
Ed Park and Walter Green, Newark, OH

First Prize:
Dustin Ehrman, Middle Amana, IA

Special Citations:
Bob Pils, White Bear Lake, MN
Flay Terres, Gastonia, NC
Warren J. Kaeb, Buckley, IL
Steve Smith and Brian Beaver, Newark, OH
Steve Lukes, Middle Amana, IA

SCHOOL AGE: NO MOVABLE PARTS

Grand Prize:
George Powers, Chad Cooperrider and Jim Watson, Newark, OH

First Prize:
Shon Lowery, Corby Franks and Joe Browett, Newark, OH

Special Citations:
John Duncan Jr., Des Moines, IA
Gregg Klatt, Menominee, MI
Matt Mohler, Keenan McKee and Todd Journey, Newark, OH
Peter Barrette, Des Moines, IA

PROFESSIONAL: MOVABLE PARTS

Grand Prize:
Neil Seely, Rochester, NY

First Prize:
Richard Grunwald, North Java, NY

Special Citations:
Kurt Jobke, Pewaukee, WI
Steven A. Bruni, Fort Madison, IA
Mike Jagielo, Almond, WI
Peter P. Belski, Jr., Pittsburgh, PA
Richard Milam, Metairie, LA

PROFESSIONAL: NO MOVABLE PARTS

Grand Prize:
Michael Watters, Saginaw, MI

First Prize:
Mike George, Slidell, LA

Special Citations:
Roger D. Coddington, Traverse City, MI
Jerry R. Syfer, Laurel MD
James N. Moen, East Grand Forks, MN
Clyde R. Moore, Cocur d'Alene, ID
Stuart L. Woldman, Shaker Heights, OH

NONWINNERS DRAWING:

James Craine, North Bloomfield, OH
Jim Sweet, Coulterville, IL
Ronald Myer, Kokomo, I
Ron Hale, Joshua Tree, CA
Alan Boyer, Cypress, CA
Ed Schott, Sacramento, CA
Heath Smith, Newark, OH

Oak Tool Box with Tools
Bill Kaiser, Huntingburg, IN

Sometimes, even the people who don't win are left feeling very good. That's the way we look at the results of the 1989 Design-a-Toy™ competition. You're all winners.

Every WOOD® magazine reader who submitted a toy should know that some kid somewhere is happier for your having cared. And, for your having applied your terrific skill in woodworking to create that much-loved toy.

At WOOD magazine, we're grateful to all the generous people who joined together to make Design-a-Toy™ a great success: The Toys for Tots program of the U.S. Marine Corps Reserve, the many manufacturers who provided prizes, our judges, Homer Formby; Major Bruce Butler of the U.S. Marine Corps Reserve; Jim Downing, Design Editor, WOOD; Roy Underhill of *The Woodwright's Shop* on PBS-TV; and Phil Vanderploeg, President, Toys and Joys.

It's been great.

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RIPPING GOOD NEWS

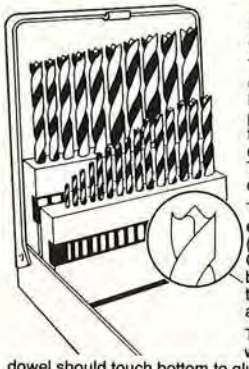
From the cutting edge of technology comes Freud's new thin-kerf blades for crosscutting and ripping. Computer-designed, laser-manufactured, Teflon-coated, carbide-tipped, 25 percent thinner than normal blades; these wood-gobblers have it all. Crosscuts leave end grain so smooth it has a sheen, and the rip blade requires less energy than full-bodied carbide-tipped blades, so it's less likely to bind and burn on thick stock. I easily ripped through 2"-oak, leaving only a light scoring. Also, you won't suffer the high-pitch noise so common with crosscut blades. The body thinness limits stock thickness to about 2"—beyond that the blade will wobble some. The rip blade is 25 percent thinner than normal; crosscut, 28 percent thinner.

—Tested by C.L. Gatzke, WOOD® magazine's art director

Freud thin-kerf crosscut and ripping blades, available in 8", 9", and 10" sizes from hardware stores and mail-order outlets nationwide at suggested retail prices of $51.90–$59.90 for the three sizes of ripping blades. Crosscut blades range from $62.90 to $73.90.

Continued on page 31

WHY PROFESSIONALS USE BRAD POINT DRILLS



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These spurs provide smooth hole walls and almost flat bottoms. A dowel should touch bottom to glue properly. Metal working drills leave a tapered bottom.

It is best to own a complete 25-pc set and have every size from 1/8" to 1/2" in increments of 1/64ths (.0156") because commercial doweling is seldom sized exactly. Dowels that are too loose don't cut it; those that are too tight don't fit.

WHY DOLLAR'S BRAD POINTS ARE BEST: Our drills are milled from the solid; others are only roll forged. Our brad points and spurs are first milled then ground for accuracy. We use high carbon, alloy steel. Many others are made from plain carbon steel. Our drills are heat treated and hardened to Rockwell C48-52. They are tough, sharp and long lasting. Most companies that sell drills do not know what they are made of, or what the hardness is.

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Sale $328

2HP, 115V, 12"x6" capacity, ⅛" max cut, 0.2"-6" range, 26.2 FPM rate, 8000 RPM, 16000 cuts, 2 feeders & extensions, all ball bearings, 65 lbs.

15" AUTO PLANER
8" Opening, 2 spds $685

15"x8" capacity, 2 feeders, 3HP 18 AM, motor, 3 blades, 15/28 FMP rates, ¼" max. cut, 0.2"-6" range, 5100 RPM/15300 cuts, 20"x16" table, 2 extensions, 520 lbs.

20" AUTO PLANER
AP200A $1175 Econ.
AP200 $1685 H.D.

5HP, 20 AMP motor, 20"x8" capacity, 4 blades, 15/28 FMP rates, ¼" max. cut, 0.25"-8" range, 20000 cuts/min, 26"x20" table, 2 feeders & extensions, 980 lbs.

DUST COLLECTOR
Sale $284

2HP, 3 intake holes (4"), 1250 CFM, 21"x37" base w/casters, 19"x36" bags, 78" height, 6.04 static pressure at 6", 210 lbs.

10" TABLE SAW
w/Standard Fence $795

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PRODUCTS THAT PERFORM

Continued from page 29

A HANDY JIG FOR FAST, ACCURATE KNIFE-SETTING

Accurately replacing jointer knives can be a real chore, but this jig helped me get the job done with precision in 10 minutes. Using permanent Alnico magnets, the jig holds the knife in alignment with the outfeed table for resetting. It will even work on nonferrous metal tables on jointers up to 10" wide, except for the Inca jointer/planer.

—Tested by Marlen Kemmet, WOOD magazine's how-to editor

Magnetic jointer knife-setting jig, item no. 20J04.01, $54.90 ppd., from Garrett Wade, Dept. WD, 161 Avenue of the Americas, New York, NY 10013. Call 800-221-2942.

POWER LIFTING

I've had my share of sore backs from lifting sheet goods, so I jumped at the chance of testing a product that might help with this chore. With the Panel Toter you can easily handle 4×8′ sheet goods. This tool lets two arms do the work of four by giving you added leverage and balance. I found the Panel Toter durable, and its handle was comfortable to use—two big pluses if you move around a lot of sheet goods.

—Tested by Steve Oswalt

Panel Toter (cat. no. 72975), $14.99 ppd. from Leichtung Workshops, 4944 Commerce Parkway, Cleveland, OH 44128.

INSTANT GRIP WITHOUT GLUE

Mr. Grip, a thin, corrugated metal fastener, provides a simple solution to the age-old problem of loose joints and screws. Just slip one of these inexpensive ¼" or ¾" strips into a screw hole or over a loose tenon and apply pressure. I found that the fastener's rough surface supplied an amazingly firm bond.

—Tested by Steve Oswalt

Mr. Grip, available in 4×¼" strips for furniture repair or 2×¾" pieces for stripped screw holes. $5.99 ppd. for each kit from Leichtung Workshops, 4944 Commerce Parkway, Cleveland, OH 44128. Call 800-321-6840 to place orders. Ohio residents call 261/831-2555.

Continued on page 32

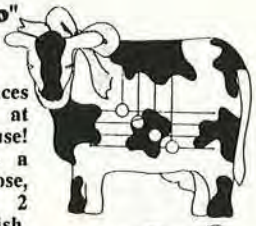
Fun To Make!

DOOR HARPS

Easy to make! Our Door Harps make great gifts that will provide years of enjoyment. Your choice of two pattern books--Musical Zoo or Traditional. Each pattern booklet includes 15 full-size patterns with easy, detailed instructions.

"Musical Zoo" Door Harps T720 $6.98

These friendly faces will be right at home in your house! Designs include a Reindeer, Moose, Cat, 2 Cows, 2 Bears, Duck, Fish, Dinosaur, Puppy, Bunny, Pig, Tiger, & a Rooster!



Traditional Door Harps T718 $6.98

These Traditional Patterns include the Tulip, Pear, Colonial, Corkboard, Heart, Bulb, Leaf, Hexagon, Harp, Frying Pan, Oak Leaf, Egg, Star, Note & Bell.

Timbers Woodworking - (916) 581-4141

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☐ QTY ____ Nickel Steel Tuning Pins Single .35 ea./100 pkg $25.00

☐ QTY ____ Tinned Steel Tuning Wire 3'- .50 / 30'- $3.00

☐ QTY ____ "T" Handle Tuning Pin Wrench $9.95

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PRODUCTS THAT PERFORM

Continued from page 31

A COLORFUL STAIN FOR COUNTRY PROJECTS

Many country projects call for pastel colors, and with Plantation Woodstains, you can add that color accent without resorting to paint. Although developed for industrial uses, Plantation Woodstains have broken into retail markets. Part of their appeal lies in the six colors available—kristy blue, peach, green, dark blue, red, and mauve. Plantation also offers four natural wood shades—walnut, rosewood, dark pine, and honey pine.

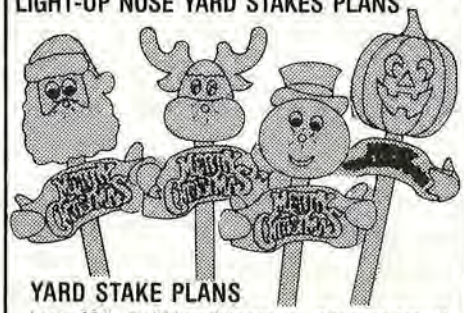
The stain applies easily, dries in 5 to 15 minutes, and requires no wiping. It gives off a powerful odor, so be sure to apply it in a well-ventilated area. The lightly toned kristy blue stain I tried performed best on open-grain woods such as pine and oak. It didn't do as well highlighting texture in harder, nonfigured woods.

—Steve Oswalt

Plantation Woodstains, available in many crafts stores at a $4.59 suggested price for a 4-oz. can. For a list of dealers in your area, write Plantation Woodstains, P.O. Box 1028, Albertville, AL 35950.

MEISEL HARDWARE SPECIALTIES
CHRISTMAS & HALLOWEEN PROJECT PLANS

LIGHT-UP NOSE YARD STAKES PLANS



YARD STAKE PLANS

Large 22″×34″ blueprints are very clear and easy to follow. All drawings are FULL SIZE.

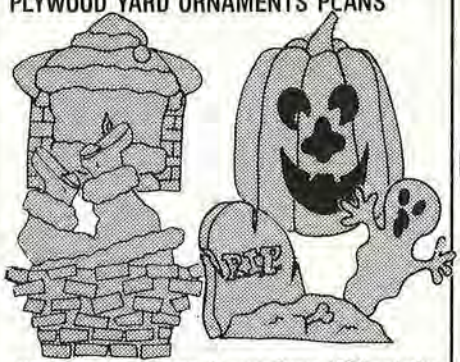
#W420 Santa Plan ..... **$3.99/EA.**
#W421 Rudolph Plan ..... **$3.99/EA.**
#W422 Snowman Plan ..... **$3.99/EA.**
#W423 Pumpkin Plan ..... **$3.99/EA.**

HARDWARE PARTS KITS

These kits contain the lighting kit, bulb, eyes, screws and pre-cut wood banner only. (Wood, plan and paint are not included.)

#8766 Light-Up Santa Hdw. Kit ..... **$5.50/EA.**
#8767 Light-Up Rudolph Hdw. Kit ..... **$5.50/EA.**
#8768 Light-Up Snowman Hdw. Kit ..... **$5.50/EA.**
#8769 Light-Up Pumpkin Hdw. Kit ..... **$5.50/EA.**

PLYWOOD YARD ORNAMENTS PLANS



Designed to be easy to cut from 1/2″ exterior plywood and easy to paint. Our FULL SIZE blueprints are available in a small, medium or large size. Large and medium ornaments mount with 2″×2″ stakes. Small ornaments use kit below.

#W444 Santa Rear View Plan 20″ ..... **$3.99/EA.**
#W445 Santa Rear View Plan 30″ ..... **$5.99/EA.**
#W446 Santa Rear View Plan 40″ ..... **$7.99/EA.**
#W451 Santa Wedged Plan 24″ ..... **$3.99/EA.**
#W452 Santa Wedged Plan 36″ ..... **$5.99/EA.**
#W453 Santa Wedged Plan 48″ ..... **$7.99/EA.**
#W457 Jack-O-Lantern Plan 27″ ..... **$3.99/EA.**
#W458 Jack-O-Lantern Plan 40″ ..... **$5.99/EA.**
#W459 Jack-O-Lantern Plan 54″ ..... **$7.99/EA.**
#W463 Ghost & Grave Plan 20″ ..... **$3.99/EA.**
#W464 Ghost & Grave Plan 30″ ..... **$5.99/EA.**
#W465 Ghost & Grave Plan 40″ ..... **$7.99/EA.**

MOUNTING ROD KIT (for small yard ornaments)

#8675 Mounting Rod Kit
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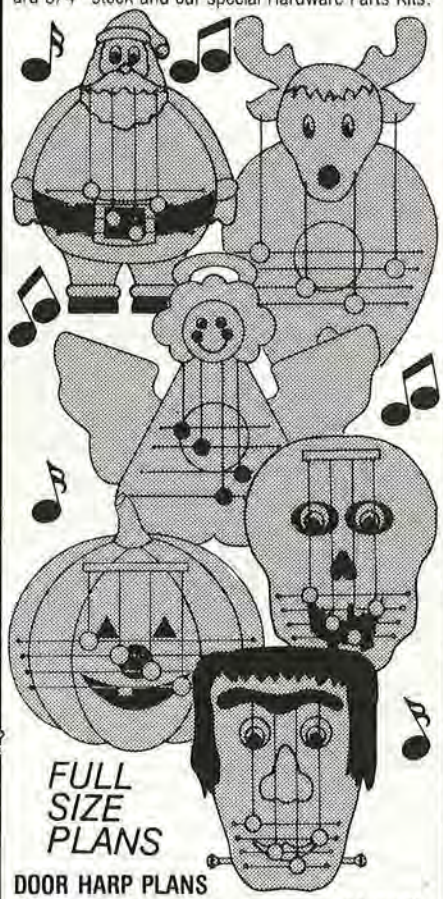
10-19 ..... **$3.99/KIT**

DOOR HARP PLANS & KITS

WHAT'S A DOOR HARP?

Mounted on the inside of your door, a door harp will welcome your guests with a beautiful musical tune each time the door is opened. You'll find it easy to build these door harps in your shop using only standard 3/4″ stock and our special Hardware Parts Kits.



FULL SIZE PLANS

DOOR HARP PLANS

#W426 Santa Plan ..... **$3.99/EA.**
#W427 Rudy Plan ..... **$3.99/EA.**
#W428 Angel Plan ..... **$3.99/EA.**
#W314 Jack-O-Lantern Plan ..... **$3.99/EA.**
#W430 Skull Plan ..... **$3.99/EA.**
#W432 Frankenstein Plan ..... **$3.99/EA.**

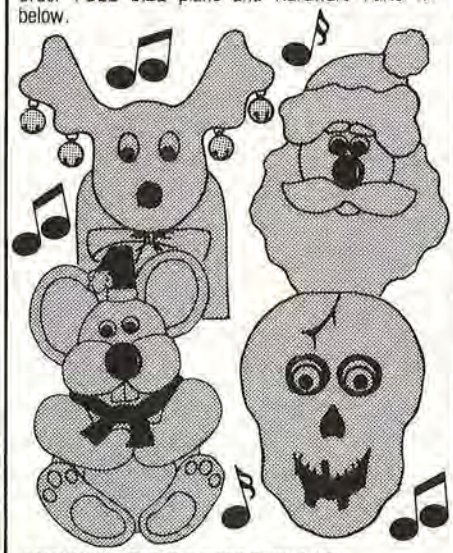
HARDWARE PARTS KITS

These kits contain the hard to get parts—special high resonance plywood, tuning pins, clapper balls, music wire and plastic eyes. You need to supply some 3/4″ stock, and the paint. Plan is not included with kit, order separately above.

#8780 Santa Hdw. Kit ..... **$6.95/EA.**
#8781 Rudy Hdw. Kit ..... **$7.50/EA.**
#8782 Angel Hdw. Kit ..... **$7.95/EA.**
#8254 Jack-O-Lantern Hdw. Kit ..... **$7.25/EA.**
#8784 Skull Hdw. Kit ..... **$7.50/EA.**
#8786 Frankenstein Hdw. Kit ..... **$7.95/EA.**

MUSICAL CHARACTERS

Push the button and the music box plays a tune. Order FULL SIZE plans and Hardware Parts Kit below.



MUSICAL CHARACTERS PLANS

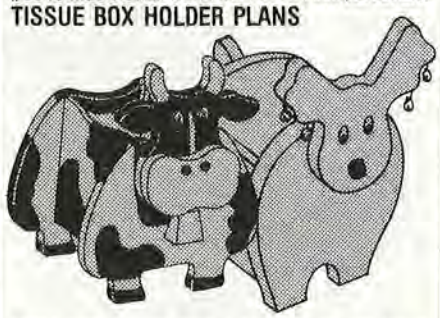
#W287 Musical Rudy Plan ..... **$2.75/EA.**
#W438 Musical Santa Plan ..... **$2.75/EA.**
#W439 Musical Mouse Plan ..... **$2.75/EA.**
#W441 Musical Skull Plan ..... **$2.75/EA.**

HARDWARE PARTS KIT

Wood not included with kit.

#7906 Music Rudy Hdw. Kit ..... **$4.79/EA.**
#8840 Music Santa Hdw. Kit ..... **$2.99/EA.**
#8841 Music Mouse Hdw. Kit ..... **$4.79/EA.**
#8843 Music Skull Hdw. Kit ..... **$3.79/EA.**

TISSUE BOX HOLDER PLANS



These cute animals hold a standard square tissue box. Easy to make from 1/2″ plywood. Available in Bessy the Cow or Rudolph the Reindeer.

#W411 Tissue Box Bessy Plan ..... **$3.99/EA.**
#W443 Tissue Box Rudy Plan ..... **$3.99/EA.**

TISSUE BOX HARDWARE KITS

Includes the eyes, nose and bells only. (Wood, paint and project plan are not included.)

#8621 Small Bessy Hdw. Kit ..... **$1.39/EA.**
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Old shoulder style (behind) compared to new safety shoulder style (front)

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SD 306	6 inches	24	13/16"	(4) 1/8" & (1) 1/16"
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SD 310	10 inches	36	13/16"	(4) 1/8" & (1) 1/16"
SD 312	12 inches	36	13/16"	(4) 1/8" & (1) 1/16"

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MESQUITE

Prime for steak, better for stock

Dark mesquite

Light mesquite

Four decades following the fall of the Alamo, the people of San Antonio paved the streets leading to this Texas shrine with mesquite slabs. Today, street maintenance crews occasionally uncover remnants of the wood, still sound.

In the eyes of southwestern Indians, mesquite was shade and sustenance. They ate the tree's bean pods, turned its sap into gum, dye, and medicine, and sewed with its thorns. The Indians relied on the wood for fuel and arrows. Learning from the native Americans, pioneer hands worked mesquite into construction timbers, railroad ties, fence posts, wagon wheels, and sturdy tables and chairs.

Because most craftsmen only equate mesquite with the barbecue grill, a group called *Los Amigos del Mesquite* (Friends of Mesquite) promotes the wood as furniture-class stock. Due to their efforts, mesquite's reputation as quality cabinet wood seems to be spreading.

Wood identification

It's estimated that the three varieties of mesquite (*Prosopis glandulosa, juliflora, and pubescens*) cover some 75 million acres of Texas alone. These hardy trees also extend into Arizona, Oklahoma, and Mexico.

In desert areas, mesquite develops more as a shrub than a tree. More favorable conditions allow it to grow to about 50′ tall with a single, though somewhat crooked, trunk up to 3′ in diameter.

Mesquite, with its chocolate-colored, furrowed bark isn't difficult to identify. Its wide, spreading canopy of frequently twisted branches sports long, thin leaves composed of evenly spaced leaflets. Bean pods up to 8″ long follow the tree's bright, yellowish-white spring flowers. And, the short, sharp thorns amidst the leaves painfully pierce passing flesh.

Mesquite wood has fine, tightly interlocked grain. A narrow band of tan sapwood borders the deep brown heartwood.

Working properties

Mesquite remains quite stable during seasoning. Since the shrinkage occurs evenly, the wood sustains few drying defects. That's why carvers and turners work the wood green—it dries without checking.

Mesquite requires power tools because it's heavier than both oak and maple, but much harder. And, since it's rather brittle and contains a high percentage of silica, the wood demands sharp cutting edges.

Due to the wood's brittleness and silica content, you must join it with both adhesives and screws. And, adhesives work best when you wipe the surfaces with lacquer thinner.

Mesquite sands silky smooth with little effort. Like a true cabinet wood, it accepts oils and topcoats equally well.

Uses in woodworking

Craftsmen draw upon mesquite for furniture, carvings, and turnings. In the home, it serves as attractive, hard-wearing flooring and decorative items such as fireplace mantels. It also makes premium gunstocks and knife handles.

Cost and availability

Although mesquite has not attained commercial importance, many small enterprises throughout the Southwest sell the wood. You'll find it most frequently as turning squares and blocks, and as lumber in 1×8 and 2×8 sizes up to 5′ long.

Prices range from $1.50 per board foot for non-select wood to $10 or more for premium stock. Veneer isn't available.

For a list of mesquite suppliers and information concerning Los Amigos del Mesquite, write: *Ken E. Rogers, P.O. Box 310, Lufkin, TX 75901.*

Photographs: Bob Calmer
Illustration: Steve Schindler

BOY! DID WE HAVE

What an incredible outpouring of generosity! We wish all of you could have feasted your eyes on the row upon row of wooden toys lovingly made by WOOD® magazine readers for our first Design-A-Toy competition.

The 425 generous souls who built a toy for a needy child have every reason to be proud. And, some of you have an extra reason to cheer: The judges selected 41 contest winners. Later, we drew seven more names from the hat to receive prizes in our nonwinners drawing.

Print this article

A TOY CONTEST!

Earlier this year, our prestigious panelists came to Des Moines to judge the competition. Pictured from left are: Jim Downing, *WOOD* magazine's design editor; Major Bruce Butler, U.S. Marine Corps Reserve, Phil Vander Ploeg, president of Toys and Joys; Homer Formby, one of America's most respected finishing experts; and Roy Underhill, master housewright at Colonial Williamsburg.

The toy collection even took seasoned woodworkers

Continued

on our panel by surprise. "When I first looked in that room," Homer said, "I didn't expect to see as many toys or that quality of toys. It tells me a lot about the craftsmanship going on out there. Look at all those wooden toys and you can see people are getting tired of the plastic world we live in."

"It was like sneaking into Santa's workshop," Roy said when he peeked in our toy room for the first time. "Everyone's been surrounded by toys in a huge toy store. But this was different. There was so much individuality and creativity in these toys. You just don't see a lot of homemade stuff in one room. All you had to add was the kids."

The Marine Corps Reserve will supply that missing ingredient—kids. Reserve units around the country now have a mountain of toys to distribute this Christmas through their successful Toys For Tots program. We're certain that your generosity *and* creativity will light the faces of 425 needy kids.

So, we applaud all of you who participated in the contest: woodworkers, sponsors, judges, and, of course, the Marines. In upcoming issues of *WOOD* magazine and *Weekend Woodworking Projects*, we'll share some of the top designs.

And, if you're wondering about another contest, the answer is yes! Look for next year's contest rules in our December issue.

PROFESSIONAL: MOVABLE PARTS

Grand Prize ($1,500 in AMI/Hegner merchandise): Neil Seely, Rochester, N.Y., waddle duck.

First Prize ($250 in Garrett Wade merchandise): Richard Grunwald, North Java, N.Y., fork lift.

Special Citations ($100 in Woodmaster merchandise): Kurt Jobke, Pewaukee, Wis., pickup truck; Steven A. Bruni, Fort Madison, Iowa, biplane; Mike Jagielo, Almond, Wis., apple with pop-up worms; Peter P. Belski, Jr., Pittsburgh, tank; Richard Milam, Metairie, La., caterpillar.

PROFESSIONAL: NO MOVABLE PARTS

Grand Prize ($1,500 in Freud merchandise): Michael Watters, Saginaw, Mich., tugboat.

First Prize ($250 in Bosch merchandise): Mike George, Slidell, La., cow puzzle.

Special Citations ($100 in Minwax merchandise): Roger D. Coddington, Traverse City, Mich., quilt puzzle; Jerry R. Syfert, Laurel, Md., three-layer puzzle; James N. Moen, East Grand Forks, Minn., teddy bear bank; Clyde R. Moore, Coeur d'Alene, Idaho, baby rattle; Stuart L. Woldman, Shaker Heights, Ohio, bank.

HOME HOBBYIST: MOVABLE PARTS

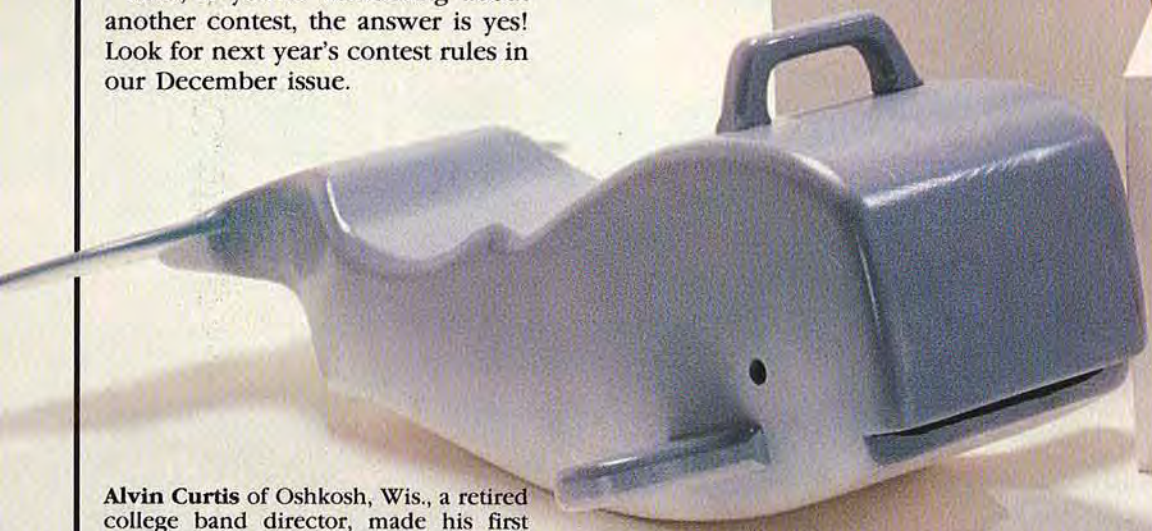
Grand Prize ($1,500 in Foley Belsaw merchandise): Robert W. Sanders, St. Marys, Ga., 1926 Mack truck.

First Prize ($250 in Makita merchandise): Harold E. Geiselman, Canton, Ohio, bumpy road pickup truck.

Special Citations ($100 in Popular Science Book Club merchandise): Bill Kaiser, Huntingburg, Ind., wooden tools; Mike Gradeless, Columbia City, Ind.,

Michael Watters of Saginaw, Michigan, hadn't built a toy before this contest, except to occasionally help neighborhood Cub Scouts with Pinewood Derby entries. He's a signmaker by trade.

Neil Seely of Rochester, N.Y., a retired Eastman Kodak camera designer, started designing his waddle duck as a project for an adult education computer-design class. He estimates spending 30 hours developing the prototype. Neil shares the design for this pull toy on pages 42–45.



Alvin Curtis of Oshkosh, Wis., a retired college band director, made his first rocking whale for his grandson. He's already working on next year's contest.

dune buggy; Rene Knetsch, Oklahoma City, moving van; Brian W. Anderson, Waseca, Minn., crane; Larry Groninger, Reedsville, Pa., cat-and-mouse pull toy.

HOME HOBBYIST: NO MOVABLE PARTS

Grand Prize ($1,500 in Delta merchandise): Alvin J. Curtis, Oshkosh, Wis., rocking whale.

First Prize ($250 in merchandise from Skil): David Cartwright, Arlington Heights, Ill., stack toy.

Special Citations ($100 in Dremel merchandise): Ronald Busdiecker, Euclid, Ohio, kaleidoscope; Sam Roberts, Roseburg, Ore., gum-ball machine; Merle Halter, North Platte, Neb., fishing game; Donald Flanagan, Shell Knob, Mo., highway bridge; Robert E. Sweet, Toledo, Ohio, doll playpen.

SCHOOL AGE: MOVABLE PARTS

Grand Prize ($1,500 in Total Shop merchandise): Ed Park and Walter Green, Newark, Ohio, truck and sailboat.

First Prize ($250 in Hitachi merchandise): Dustin Ehrman, Middle Amana, Iowa, 4-wheeler.

Special Citations ($100 in Formby's merchandise): Bob Pilz, White Bear Lake, Minn., garbage truck; Flay Terres, Gastonia, N.C., train engine; Warren J. Kaeb, Buckley, Ill., space shuttle; Steve Smith and Brian Beaver, Newark, Ohio, helicopter; Steve Lukes, Middle Amana, Iowa, wagon.

SCHOOL AGE: NO MOVABLE PARTS

Grand Prize ($1,500 in Black & Decker merchandise): George Powers, Chad Cooperrider, and Jim Watson, Newark, Ohio, telephone.

First Prize ($250 in Grizzly merchandise): Shon Lowery, Corby Franks, and Joe Browett, Newark, Ohio, puzzle.

Special Citations ($100 in DML merchandise): John Duncan Jr., Des Moines, Iowa, bank; Gregg Klatt, Menominee, Mich., snowmobile; Matt Mohler, Keenan McKee, and Todd Journey, Newark, Ohio, country buildings; Peter Barrette, Des Moines, puzzle.

NONWINNERS DRAWING

$1,400 in Shopsmith merchandise: James Craine, North Bloomfield, Ohio.

$1,000 in Porter Cable merchandise: Jim Sweet, Coulterville, Ill.

$500 in Ryobi merchandise: Ronald Myer, Kokomo, Ind.

$250 in AEG merchandise: Ron Hale, Joshua Tree, Calif.

Ripstrates from Fisher-Hill Products: Alan Boyer, Cypress, Calif.; Ed Schott, Sacramento, Calif.; Heath Smith, Newark, Ohio.

Bob Sanders of St. Marys, Ga., spoiled the side dump truck he built a week before the contest deadline. He quickly changed bed designs and then rushed his 1926 Mack truck to Des Moines. Bob works as an electrical engineer for General Dynamics.

Walter Green and Ed Park spent six weeks building the tractor, semitrailer, and sailboat in their industrial arts class at Licking Valley High School in Newark, Ohio. Their teacher, Barry Healey, gave both boys an "A" on the project—and so did our panel of judges.

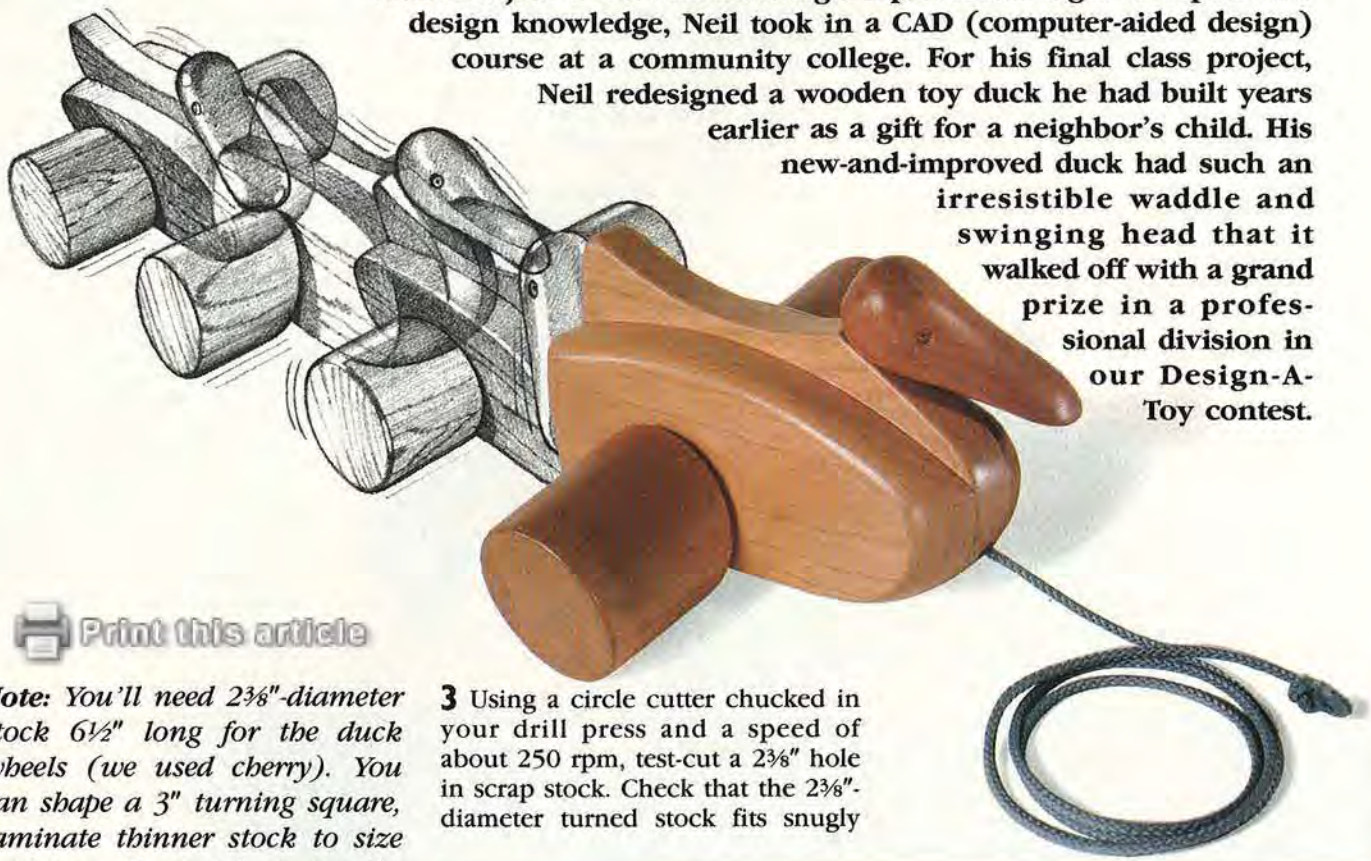
Jim Watson, Chad Cooperrider, and George Powers, also Licking Valley students, were—according to Jim—"pretty surprised and happy we won."

Photographs: Jim Kascoutas

READ ALL ABOUT IT!

DUCK WADDLES OFF

After 30 years at Eastman Kodak, Neil Seely took early retirement from his job in the camera design department. Eager to expand his design knowledge, Neil took in a CAD (computer-aided design) course at a community college. For his final class project, Neil redesigned a wooden toy duck he had built years earlier as a gift for a neighbor's child. His new-and-improved duck had such an irresistible waddle and swinging head that it walked off with a grand prize in a professional division in our Design-A-Toy contest.



Print this article

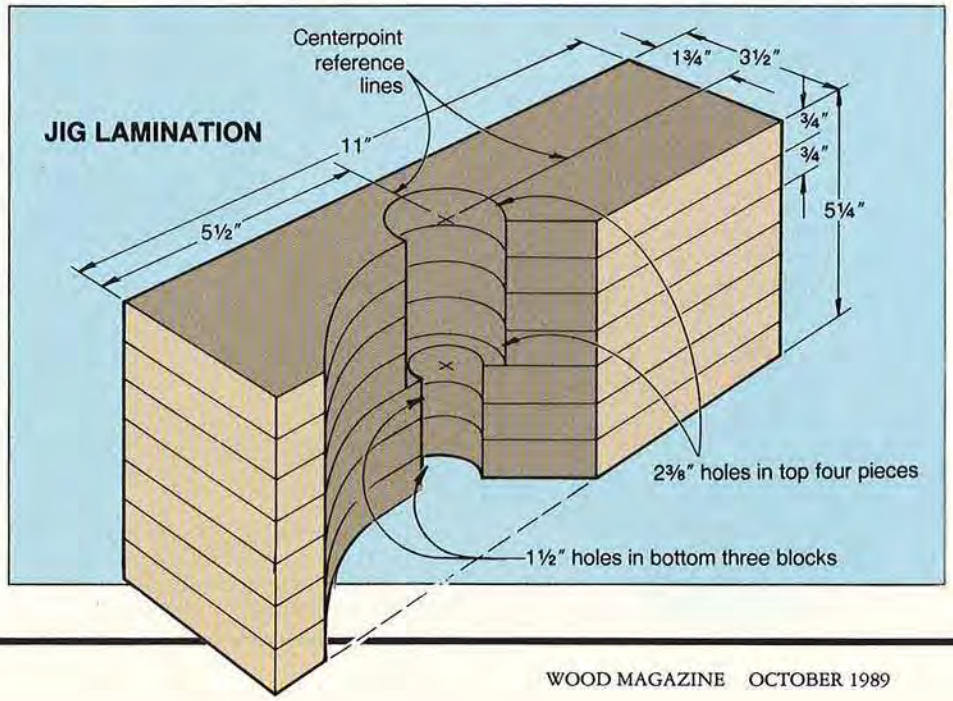
***Note:** You'll need 2⅜"-diameter stock 6½" long for the duck wheels (we used cherry). You can shape a 3" turning square, laminate thinner stock to size and turn it round, or see the Buying Guide at the end of this article for our source of either a 3" turning square or stock already turned to 2⅜". If you turn your own stock, mount a turning square between centers, and turn it to a 2⅜" outside diameter. Check the diameter as you go with an outside calipers.*

PRO"DUCK"TION BEGINS WITH THE WHEEL JIG

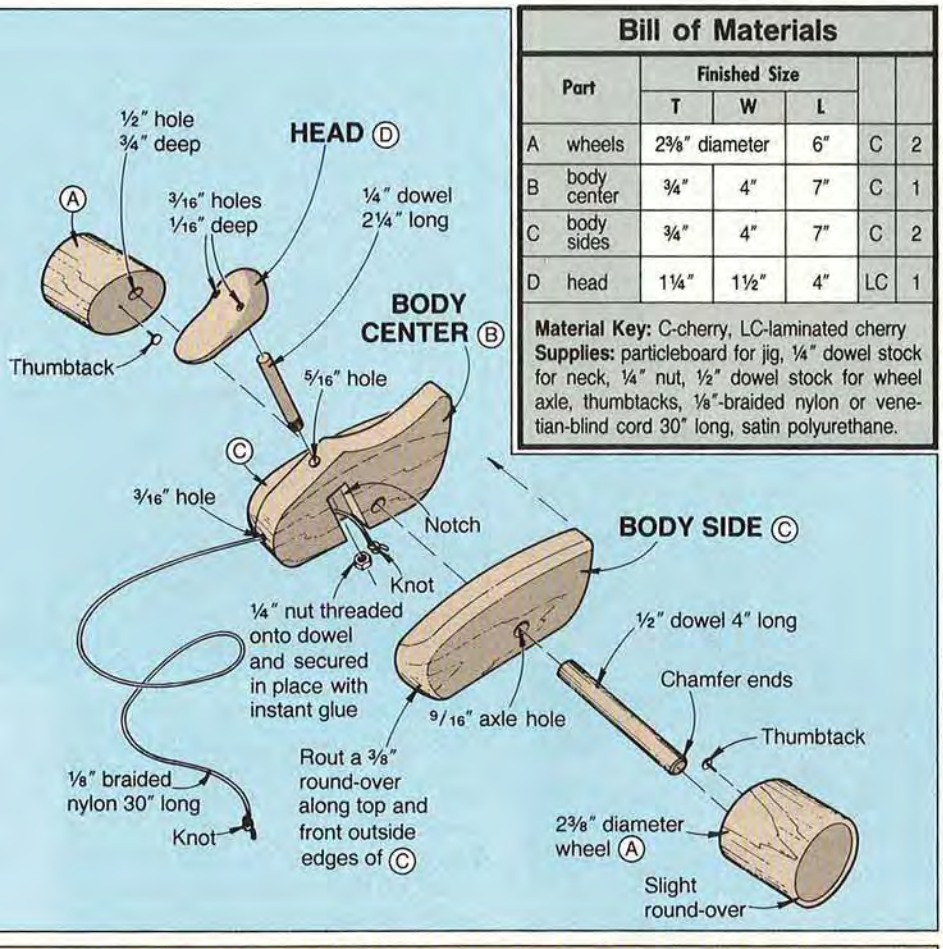
1 From ¾"-thick particleboard or plywood, cut seven pieces 3½" wide by 11" long.

2 Measure and mark a centerpoint on the *top* face of each piece (see the Jig Lamination Drawing, *right*).

3 Using a circle cutter chucked in your drill press and a speed of about 250 rpm, test-cut a 2⅜" hole in scrap stock. Check that the 2⅜"-diameter turned stock fits snugly



WITH A GRAND PRIZE

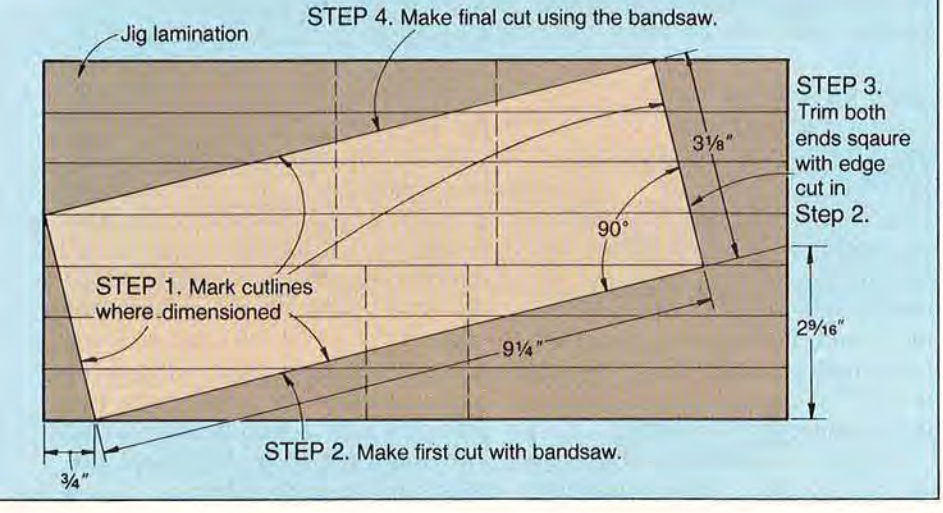


Bill of Materials

Part		Finished Size T	W	L		
A	wheels	2⅜" diameter		6"	C	2
B	body center	¾"	4"	7"	C	1
C	body sides	¾"	4"	7"	C	2
D	head	1¼"	1½"	4"	LC	1

Material Key: C-cherry, LC-laminated cherry
Supplies: particleboard for jig, ¼" dowel stock for neck, ¼" nut, ½" dowel stock for wheel axle, thumbtacks, ⅛"-braided nylon or venetian-blind cord 30" long, satin polyurethane.

CUTTING THE JIG TO SHAPE



inside the hole in the scrap stock. If the turned stock fits loosely, you will have problems later drilling an accurate axle hole. Adjust the circle cutter if necessary. Center the circle cutter pilot bit directly over the marked centerpoint. Slowly lower the cutter into the stock to cut a 2⅜" hole in four of the jig pieces. Cut or bore a 1½"-diameter hole in the other three pieces.

4 Carefully align the holes where shown on the Jig Lamination Drawing, and glue and clamp together the pieces with the 2⅜" holes. (We inserted the 2⅜" turned stock to align the four holes. Once aligned, we clamped together the pieces, removed the turned stock, and wiped off all glue squeeze-out with a damp cloth.) Now, glue and clamp together the three pieces with the 1½" holes, making sure to align the holes. Finally, glue and clamp together the two laminations, with the ends and edges flush.

5 Now, follow the four-step drawing *below left* to mark and cut the jig lamination to shape.

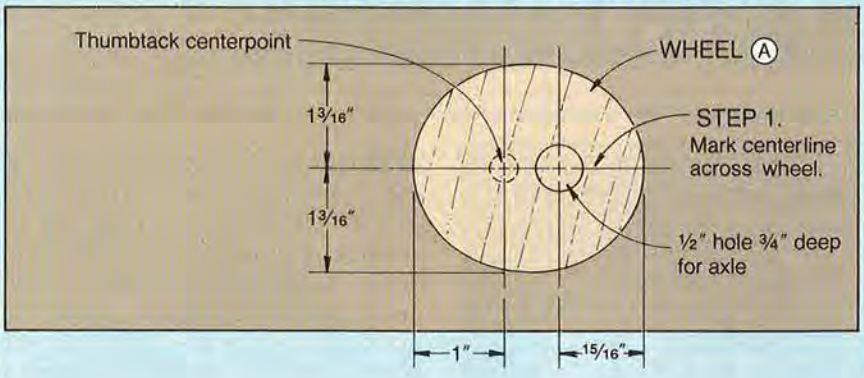
ANGLE-CUT THE WHEELS WITH THE JIG

If you've turned your own cherry stock for the 2⅜" wheels, crosscut about ⅛" off each end to remove the spur-center and tailstock marks.

Insert the turned cherry stock into the hole in the jig, and trim each 2⅜"-diameter duck wheel to length.

Continued

LOCATING THE AXLE AND TACK CENTERPOINTS



STEP 3. Measure 1" from left edge of wheel and mark a third reference line to locate thumbtack centerpoint.

STEP 2. Measure 15/16" from right edge of wheel and mark a second reference line across wheel to locate axle centerpoint.

2 Stick the 2⅜" stock all the way into the 2⅜" hole in the jig. To ensure your wheels will end up the right length, the turned stock must bottom out in the 2⅜" hole in the jig. Position the jig between the tablesaw blade and fence where shown in the photo at the bottom of the previous page.

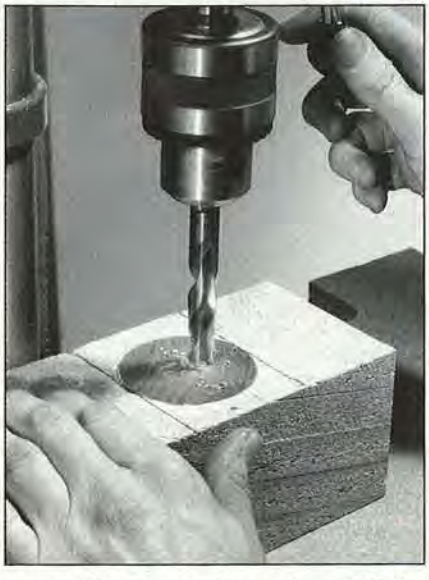
3 Start the saw and cut the turned stock flush with the face of the jig as shown in the above-mentioned photo to form one wheel (A).

4 With the wheel still in the jig, carefully locate and mark centerpoints for the ½" axle hole and the thumbtack on the cut end of the wheel where shown on the drawing *above*.

5 Chuck a ½" brad-point bit into your drill press and bore ¾" deep into the turned stock as shown in the photo at *right*. (We had our drill press running at 250 rpm.) To prevent the wheel from turning in the jig, feed the bit slowly into the turned stock and back out several times to remove the waste stock. Push a dowel through the 1½" hole in the jig to pop out the wheel.

6 Repeat steps 1, 2, 3, 4, and 5 above to form the second cherry wheel (A).

7 Sand a slight round-over along the outside edge of each wheel where shown on the Exploded-View Drawing.



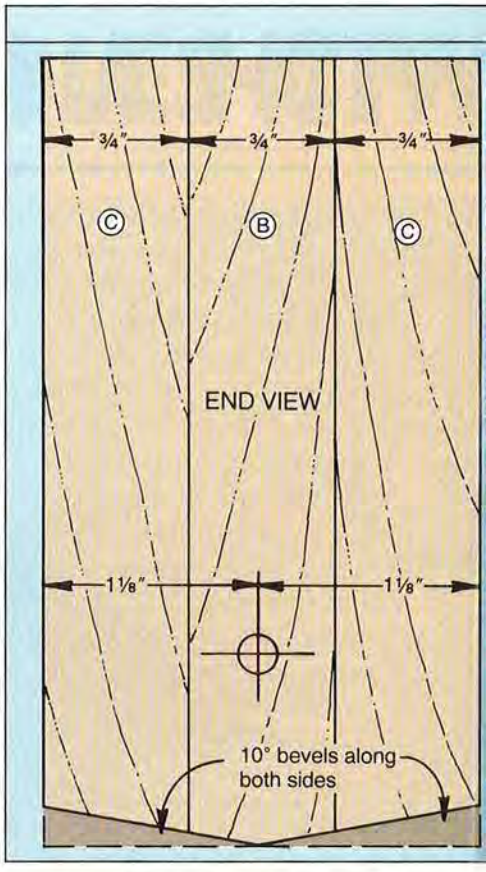
Center the bit over the mark, and drill a ½" hole ¾" deep in the wheel; then remove the wheel from the jig.

NOW, MOVE ON TO THE DUCK'S BODY

1 From ¾" cherry, cut three pieces 4×7" for the duck body.

2 With carbon paper or by adhering a photocopy of the full-sized Side-View Body Pattern on the opposite page, transfer the outline, notch, and head-dowel centerline of the body center (B) to one of the 4×7" pieces of cherry. Cut the outline and notch to shape.

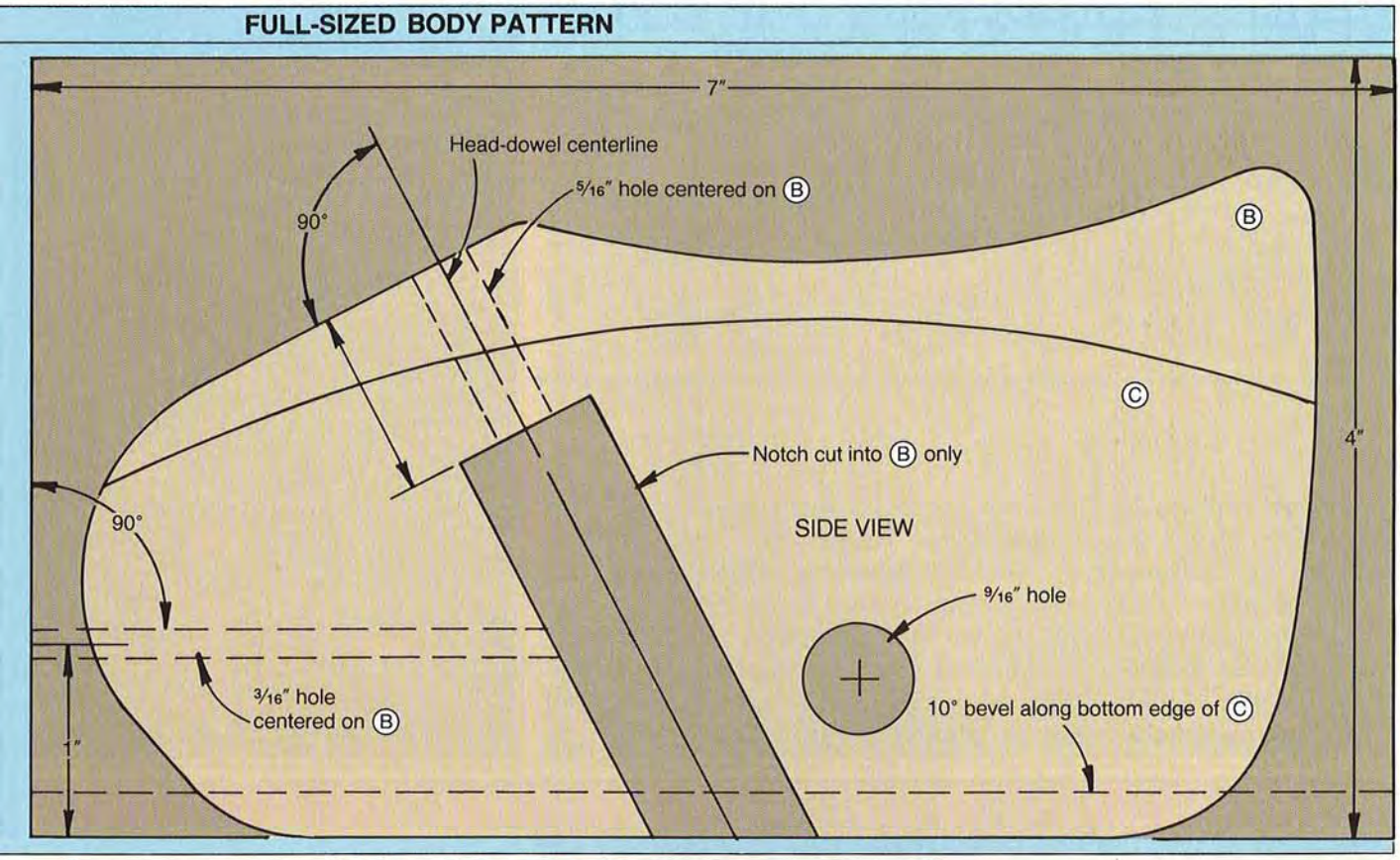
3 Transfer the outline for the body side (C) to one of the remaining pieces. Bandsaw and sand it to shape, and use it as a template to mark the outline onto the other body side. Then, cut the outlined piece to shape.

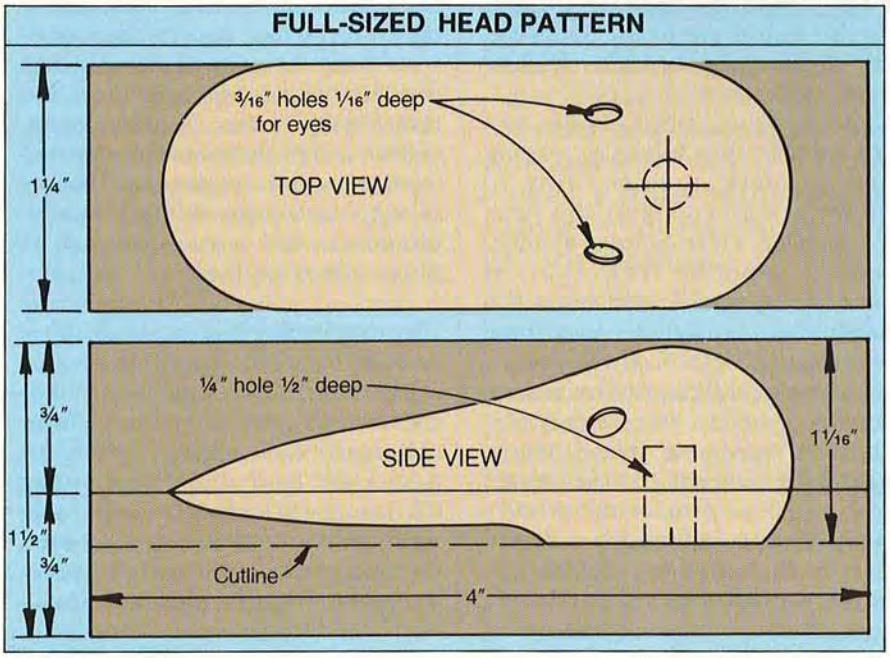


4 Drill a 5/16" hole through the body center (B) for the head dowel (we used a dowel jig to help align the bit). Now, drill a 3/16" hole through the front of the body center for the pull rope where shown on the Body Pattern Drawing.

5 Rout a ⅜" round-over on both body sides (C) where shown on the Exploded-View Drawing. With the bottom and back edges flush, glue and clamp together the three body pieces.

6 Mark a 10° bevel line on the front and back ends of the body lamination where shown on the drawing *above*. Now, connect the ends of the bevel lines by drawing a line along each side of the lamination. Clamp the duck body upside down in a woodworker's vise and hand-plane or belt-sand the edges to the marked lines.





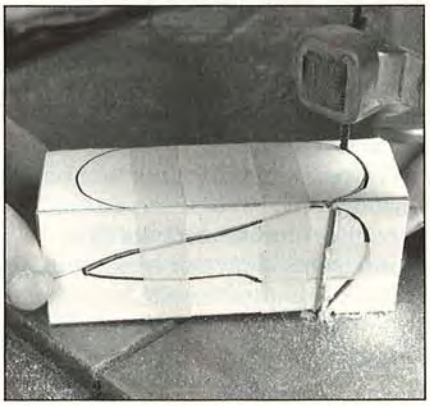
7 Mark the centerpoint location, and bore a 9/16" axle hole through the body where shown on the Body Pattern Drawing at *top*.

8 Sand the duck body smooth.

NEXT, CUT AND SHAPE THE DUCK'S HEAD

1 To form the head (D), cut a block to 1¼ × 1½ × 4". If you don't have stock this size, laminate ¾"-thick stock and trim it to size, noting the lamination line shown on the Side View of the Head Pattern.

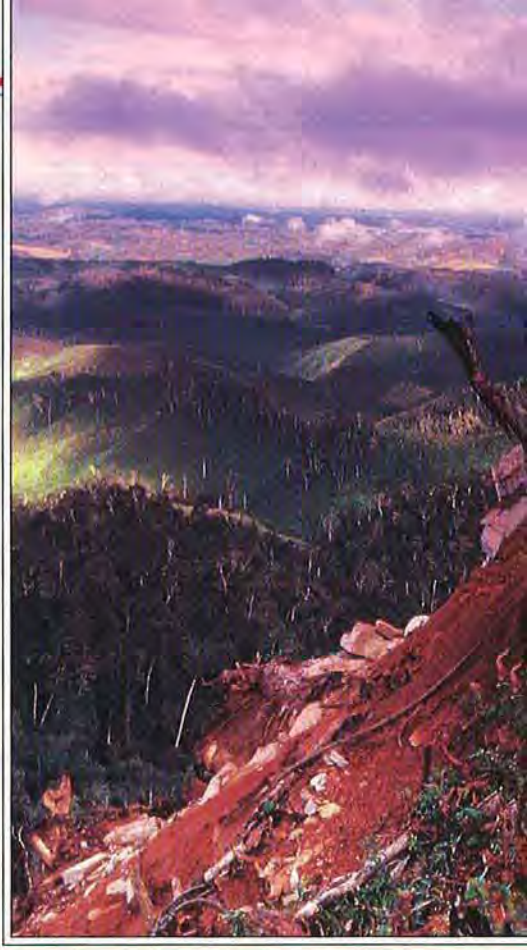
2 Transfer the full-sized top and side head patterns to the cherry block. Mark the ¼" dowel hole centerpoint, and drill the hole where marked. Bandsaw the head side view to shape. Tape together the pieces and cut the top-view pattern to shape as shown *below*.



Cut the side-view head pattern to shape. Tape the pieces back together, and cut the top-view pattern.

Continued on page 88

WHAT'S HAPPENING TO THE WORLD'S WOOD?



Print this article

Fueled by reports of millions upon millions of tropical and temperate forest acres threatened, then lost each year, it seems as if everyone—from schoolchildren to politicians, and a fair number of woodworkers—wants answers to what the future holds for the world's timber. In this four-page section, Pete Stephano, WOOD® magazine's features editor, capsulizes the situation around the world today and presents the outlook as related to him by some of the most informed people in the field.

CONCERN NO. 1: CAN WE SAVE THE TROPICAL FORESTS?

From the Congo to the Amazon to Java, 27 million acres of tropical forest are consumed each year—a rate of about one square mile every 12 minutes—for lumber, agriculture, grazing, roads, mining, and other purposes.

What's happening—and why

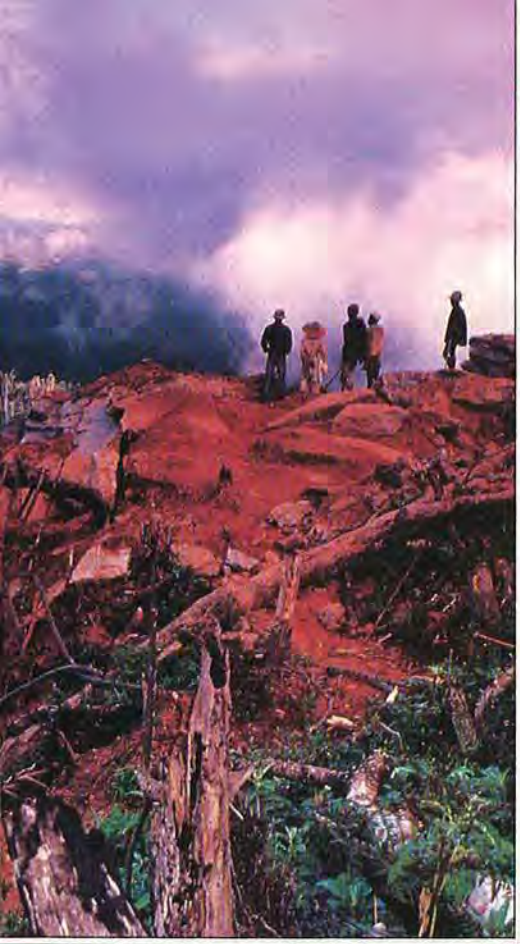
- The earth's tropical forests—once twice the size of the U.S.—have been cut in half. Remaining tropical forests in South America's Amazon, Southeast Asia, and the African Congo region, number about 3 billion acres. At present, the Congo forests remain relatively untouched.
- Commercial timber harvesting in the tropical forests accounts for 11 million acres per year—two-thirds of that in Southeast Asia.
- Conversion to agricultural land and pasture destroys the most forest. "Generally, the tropics are not a major source of commercial wood," notes Roger Sedjo, of Resources for the Future.
- The most intensively logged tropical forests are in the South Pacific, from Malaysia and Indonesia to the Philippines.
- In the tropics, especially the Amazon, people clear forests by cutting down growth, then burning it. Known as slash-and-burn, this practice parallels clear-cutting, a sometimes acceptable technique of forest management. The forest has the ability to rejuvenate, given time to reestablish itself. However, in less-developed countries where food has priority, trees aren't permitted to regrow on cleared land.
- Burning tropical forests creates close to 20 percent of the world's carbon dioxide released into the atmosphere, contributing to the "greenhouse effect." Total U.S. emissions from burning fossil fuels adds about 25 percent.

To the nations in the tropics, timber easily converts to needed financial capital. Historically, there's plenty of precedent for such action. "England cut her forests, built a navy, and as a result, dominated the seas for 150 years. The Chinese traded forests for agriculture. Countries have always overexploited their timber resource to achieve national goals," says Dr. Ben Jayne, author and professor of forestry and environmental resources at Pennsylvania State University. "It is very difficult to tell a country such as Brazil not to do that."

The outlook

Lacking international guidance and regulation, there's little to restrain the lesser developed countries from cashing in their tropical forests for timber and agricultural land to pay off international debt and raise their standard of living. However, the horizon has some bright spots:

- *Brazil rethinks forest destruction.* Pressure from the World Bank and Inter-American Development Bank brakes the freewheeling destruction of Brazil's Amazon forests by urging land-use studies. In the U.S., legislation requires American investors to encourage nations to swap debt for forest conservation.



◀ Forests, such as this one in Madagascar, fall to roads, agriculture, and logging.
▼ Even clear-cut forests will rejuvenate all by themselves. This was taken on Washington's Olympic Peninsula.

● *Tropical countries add acres.* Venezuela recently added 2.5 million acres to its national parks. Bolivia now manages a 1.2 million-acre forest for sustained yield. And, Costa Rica re-creates a 203,000-acre forest by planting and regeneration.

● *Trees combat greenhouse effect.* Through photosynthesis, trees transform carbon dioxide (CO_2) into carbon, and thus become a major factor in keeping CO_2 in balance. On average, a forest tree absorbs about 13 lbs. of CO_2 a year.

As a possible prototype of private sector effort, a Virginia-based company, Applied Energy Services, plans to offset the CO_2 emissions from its new coal-fired power plant in Connecticut by planting trees in Guatemala. The company donated $2 million for seedlings.

Global Releaf, a program of the American Forestry Association, promotes tree plantings. Focusing first on urban America, Global Releaf will attempt to fill 100 million tree spaces to displace 18 million tons of U.S. CO_2 from the air annually.

CONCERN NO. 2
HOW MUCH TIMBER DO WE HAVE LEFT?

Since settled agriculture began about 10,000 years ago, forests and woodlands have dwindled by nearly 5 billion acres, a third of the original total, reports the Worldwatch Institute.

What's happening—and why

● The American Forest Council estimates that U.S. forests today number 737 million acres, about 70 percent of what were encountered by the first New World settlers. In 1920, forests covered only 615 million acres.

● Today, forest cover remains fairly stable in most industrial countries. In fact, it's even increasing.

France, once 80 percent trees, had only 14 percent by the late 1800s. Today, about 25 percent of France has trees. The United Kingdom's forests have expanded 86,000 acres a year since the '60s. China has a goal of greening one fifth of its land by the year 2000.

In the U.S., reforestation reaches new heights. During 1987, tree plantings amounted to 2.3 billion seedlings on 3 million acres. That's, about 10 new trees for every American, cites the USDA Forest Service.

● Rivaled only by South America in acres of forest, the Soviet Union has 2.3 billion acres, spread primarily across Siberia.

The outlook

On this front, things look promising, for several reasons. First, forests increase in land area when nations undergo transition from a farming society to an industrial one. With the economic diversity, more land becomes available to revert to forest. Too, as young nations mature, management policies emerge to protect the forest resource. Modern agricultural methods also require less land. And, forests have a natural resiliency. Without a constant effort to

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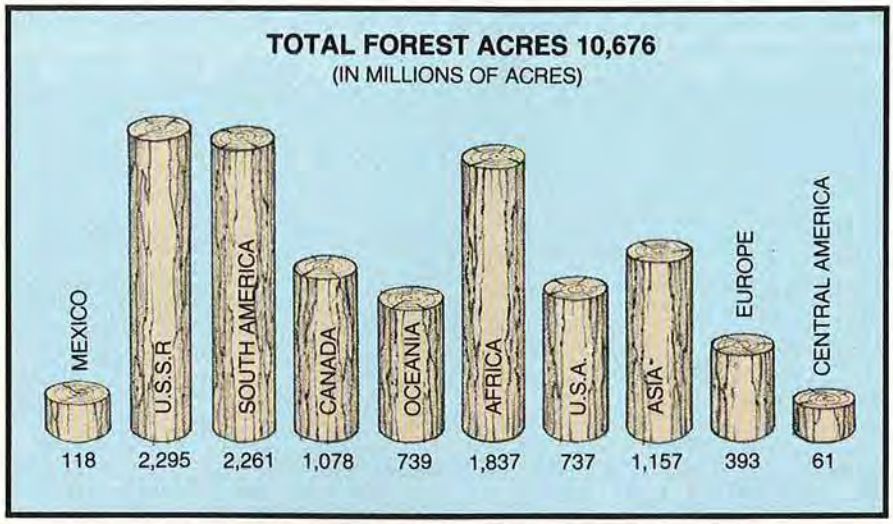


keep forests off the land, they move in to reclaim it.

Second, in some areas of the world, such as the vast Siberian forests of the Soviet Union, enormous hauling distances hamper timber harvesting. The African Congo region remains pristine because of its sparse population.

And third, through manipulative genetics, fertilization, commercial thinning, and other means, today's trees can reach maturity quicker. In fact, the Weyerhaeuser Company has developed trees that reach merchantable size in half the time it takes Mother Nature.

CONCERN NO. 3: CAN THE U.S. AFFORD TO EXPORT WOOD?

Japan, China, and other countries bought $10 billion in forest products from the U.S. in 1987. Exported saw logs, veneer logs, and logs for other purposes amount to over 3 billion cubic feet annually.

What's happening—and why

- U.S. forest industries cut 17 billion cubic feet of wood in 1987. From that, 751 million cubic feet of forest products were exported.
- On an annual basis, U.S. forests grow 22 billion cubic feet of new timber, and we remove 17 billion.
- Tropical hardwood supplies, particularly in the Amazon basin and Southeast Asia, are being drawn down. "The drawdown of tropical hardwoods is beginning to create a shortage of quality hardwoods for furniture manufacture," notes Penn State's Ben Jayne. "Those who use that source for material—the Japanese and Taiwanese, for instance—have to seek other sources, such as the Appalachian hardwoods."
- Recent USDA Forest Service statistics indicate that the U.S. wood inventory appears solid, at least in the overview. "We have an accumulation of wood in most parts of the nation," Jayne explains. "But, it's mostly softwood. In the hardwoods, there's probably a lower quality available now than there was in the past. Nevertheless, there is a larger number of small hardwood trees growing rapidly."

The Hardwood Manufacturers Association says the import of wood furniture rises every year. Crazy as it sounds, firms profit by shipping American logs and lumber to foreign countries manufacturing products with cheap labor, then shipping the goods back to the U.S. This raises U.S. wood prices.

The outlook

Expect new sources of wood. New Zealand, Chile, and South Africa have extensive plantations of pine nearing the age for harvest.

Despite new wood sources, you can expect temporary shortages in the long-term. It may become difficult to get particular hardwood species, and board sizes will be smaller. Woodworkers will have to use more veneers and rely on boards made up for width. Substituting stock will also become commonplace as present low-value, under-appreciated wood replaces supplies of now-favored species. To alleviate long-term problems, hardwoods must now be managed as productively as softwoods, cautions international expert Jayne.

▲ Freighters leave North American ports loaded with exported logs. New spruce trees follow burned ones in this Canadian forest. ▶

CONCERN NO. 4: FIRE, INSECTS, AND DISEASE: HOW HEAVY A TOLL?

Last year's Yellowstone fire burned, scorched, or somehow affected about one-third of the national park's 2.2 million acres. Other fires in U.S. forests during 1988 brought the total to 6 million acres, notching the year as one of the greatest for fire in recent times. And, insect infestations and blight continue attacking our forests every year.

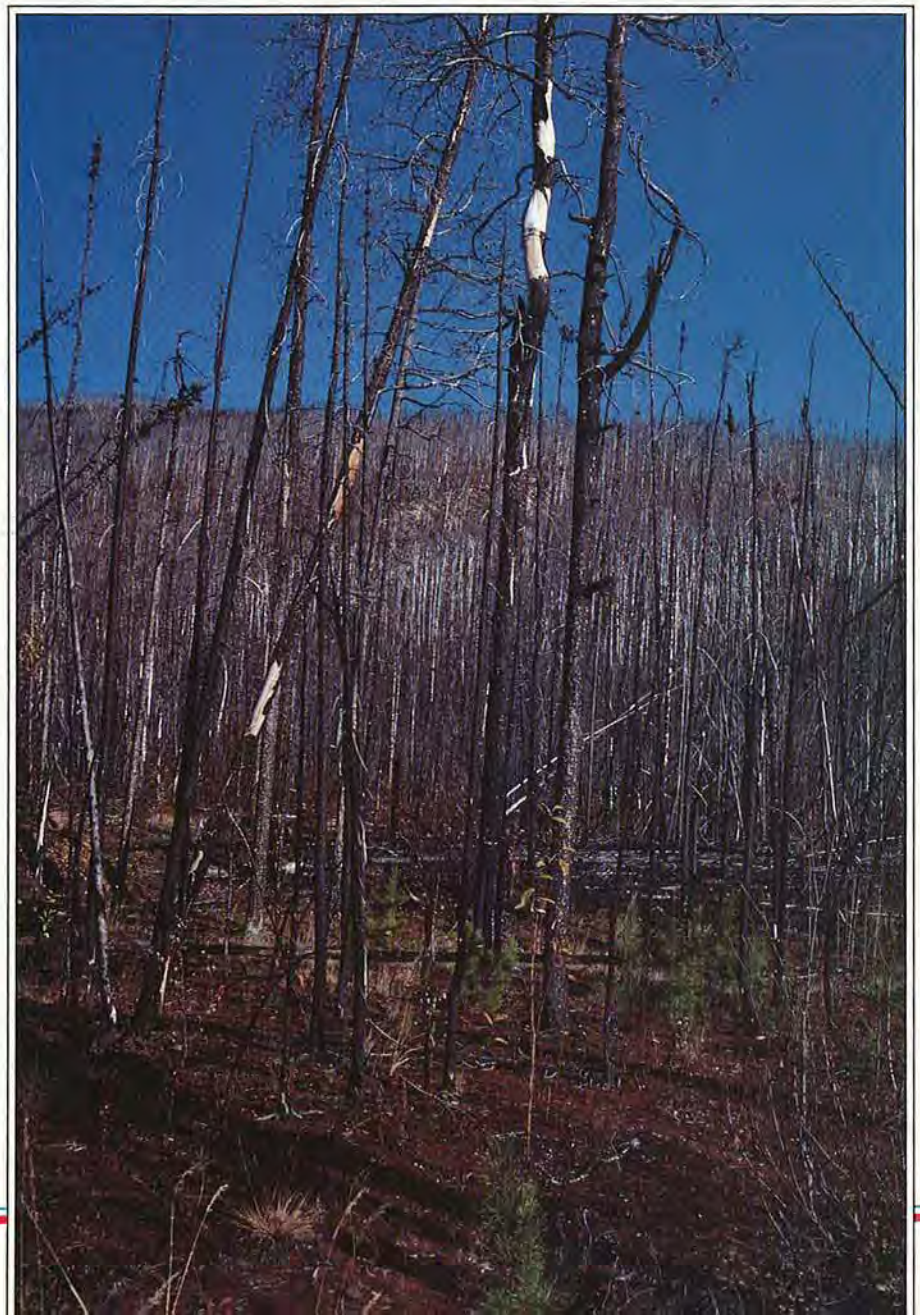
What's happening—and why

• Compared to the past, 1988 wasn't a record year for fire. In the 1930s, a 40-million-acre loss to wildfire was common.

Natural fires, caused by lightning, often are permitted to burn themselves out in the publicly owned forests. Most such fires remain relatively small. Few fires happen on privately owned, industrial forestland, where there's little fuel buildup from dying trees. Increased forest use by campers, hikers, naturalists, hunters, and fishermen, contribute accidental fires.

• Annual forest statistics do not provide a separate category for timber loss due to disease and insects. In 1986, mortality, defined as sound wood in trees that died from natural causes, including fire, was about 4.5 million cubic feet. This amount equals one-half of 1 percent of the total growing stock in the nation. Many of those trees, though, aren't lost. In infestations, as well as fires, it's common to salvage sawable timber. Tragic blights, such as the one that bowled the American chestnut over, prove rare.

• Acid rain, the combining of sulfuric oxide with precipitation, impacts U.S., Canadian, and European forests, but how and how much has yet to be determined.



The outlook

The ability to control fire has been a major factor in the expansion of our commercial forest land. Yet, in some cases, fire enables desirable new trees to sprout.

Reintroduction of natural controls, the recognition of insect threats, and technological advances in forestry genetics should reduce future damage from infestation.

For sources of more information, as well as organizations to join, please turn to page 93.

Written by Peter J. Stephano
Photographs: Madagascar, Frans Lanting; clear-cut, ©1989 T.W. Ransom/Biological Photo Service; freighter, ©1989 J.N.A. Lott/Biological Photo Service; fire damage, ©1989 B.J. O'Donnell/Biological Photo Service
Illustrations: Jim Stevenson
Compiled with aid from the American Forestry Association; American Forest Foundation; Environmental Defense Fund; John Heissenbuttel, American Forest Council; Dr. Ben Jayne, Pennsylvania State University; Rain Forest Action Network; Roger Sedjo, Resources for the Future; Profs. Buck Sanford and Dan Binkley, Colorado State University; The Smithsonian Institution; Timber Holdings, Ltd., Milwaukee, Wis.; USDA Forest Service; and the Worldwatch Institute.

WORKING SMALL

TIPS AND STRATEGIES THAT LET YOU EXPLORE THE WORLD OF SMALL-SCALE WOODWORKING

In woodworking, *bigger* is not always *better*. In fact, you'll find that working tiny pieces of wood into projects smaller than your fist can be just as gratifying as building cabinet-size projects. And, put away your wallet because woodworking in this Lilliputian land doesn't cost a plug nickel to try. You need only look to your scrapwood pile for a lumberyard of materials.

When *WOOD®* magazine's project builder Jim Boelling began experimenting with small pieces of wood a couple years ago, little did he know that he was embarking on something that would soon consume him. "After 20 years of checking for straight and square, it was a refreshing and creative change of pace to work on small, free-form objects," says Jim.

Nowadays, Jim constantly comes up with miniature creations like those shown on these pages. What's his secret? "The key to working small is maintaining control of the workpiece while keeping your hands a safe distance from the cutting or shaping action."

In the course of working small, Jim goes through the same processes that you would with any project. But, he does them in some ways you may never have thought of.

We'll also look at a couple of tips that *WOOD* magazine reader Bill Wright shared with us on how to shape small objects with flexible sanding discs. Thanks, Bill!

SAWING

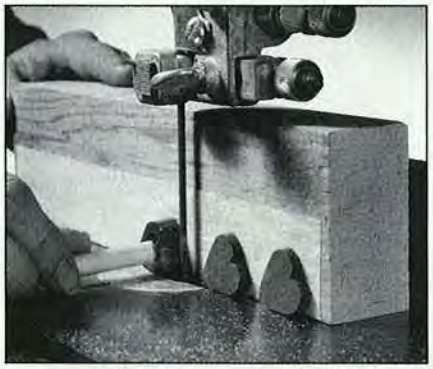
Print this article

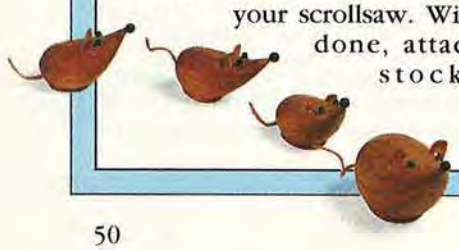
Slice your scrap into usable thin stock with your tablesaw and this handy technique. First, use cloth-type, double-faced tape to attach the scrap stock to a carrier board at least 6" high and a couple of inches longer than the scrap piece as shown at *right*. Ensure a good bond by squeezing the two pieces together in a bench vise.

Now, stick a 6" piece of duct tape to the other side of the scrap and double it over to form a handle. Then, adjust your tablesaw's fence so that the saw cuts a piece of wood of the desired thickness from the carrier-board side of the scrap. Remove ⅛" or thinner stock from the carpet tape by saturating the tape with lacquer thinner.

Here's an efficient way of cutting identical pieces that's about the neatest thing since sliced bread. You'll find this technique especially handy for making jewelry such as earrings or necklace pieces.

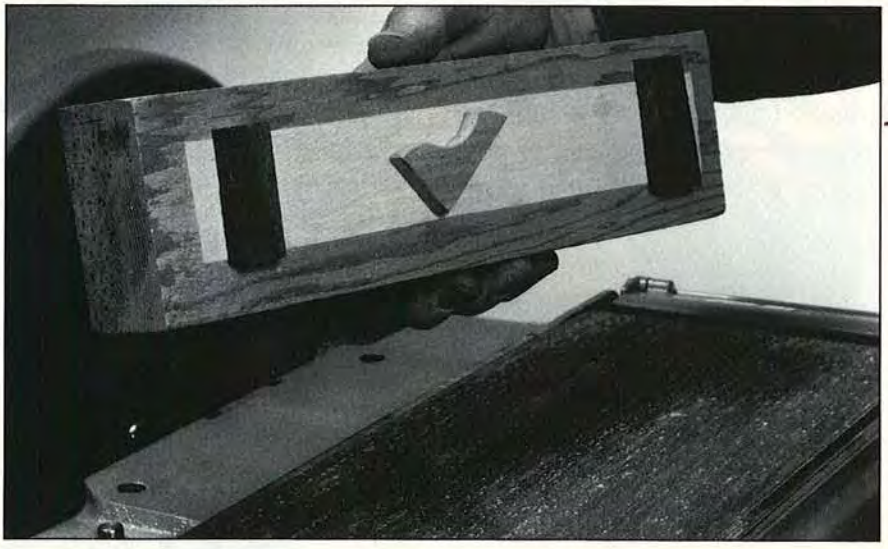
First, cut the desired shape with your scrollsaw. With that done, attach the stock to a jobber stick (⅜" dowel) with cyanoacrylate (instant) glue (see page 55 for a buying source). Epoxy or hotmelt adhesive also works, but we like the convenience of the instant glue. Next, press the stock against a carrier board covered with double-faced tape and slice off a succession of blanks as shown at *right*. If the pieces resist being pryed off, apply lacquer thinner to the tape to dissolve the adhesive.





PROVEN TECHNIQUES FROM THE SHOP TESTED WOOD MAGAZINE SHOP

Jim Boelling works small in a big way. You can apply his tactics for handling tiny stock to your own projects.



SANDING

You can avoid nasty sanding burns on your fingertips by sanding small pieces as shown at *left* with a carrier board, double-faced tape, and two scrap blocks of the same thickness as your workpiece. By placing the project piece between the scrap blocks, you'll also eliminate the chance of rolling the workpiece and rounding its edges. Be sure to attach the workpiece so that you sand the grain in the same direction as the sanding belt.

Continued

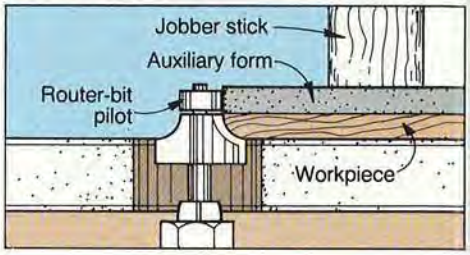
ROUTING

Play it safe by keeping your hands clear of whirling router bits. We've found a couple of ways to do this. Which one you use depends on the size of the piece you're working. If the workpiece is large enough to attach a 1"-diameter jobber stick to it, use this method. If not, the method at *far right* may work for you.

First, attach the jobber stick (dowel stock, hand railing or closet pole works well) to the workpiece with carpet tape, epoxy or hotmelt adhesive. Then, build a "zero-clearance" auxiliary surface for your router table. To do this, start by boring a hole into a piece of tempered hardboard that's just large enough for the router bit to stick through. This auxiliary surface fully supports the workpiece around the router bit.

To prevent the bit from grabbing your project, hold the workpiece tightly against the fence before you ease it into the cutting edges. As shown at *right* we're routing a cove along the edge of a miniature shelf.

If the bit's pilot sits so high on the shank that it doesn't contact the workpiece, you'll have to cut an auxiliary form for the pilot to ride on. The form should be the same shape as the workpiece and high enough to contact the pilot as shown at *right*. Attach the form to the workpiece with carpet tape.



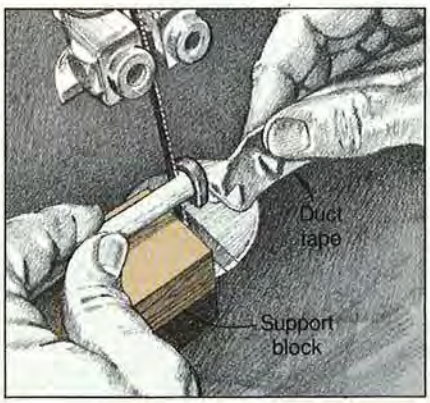
SHAPING

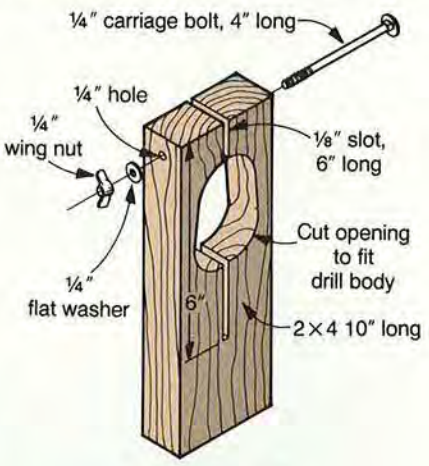
To shape small parts freehand, we're sold on flexible sanding discs. (See the Buying Guide on page 55 for our source.) First, attach the workpiece to a jobber stick with instant glue. Then, sand it to shape as shown *below left* with 60-grit sandpaper and smooth it through a succession of 100-, 150-, 220-, and 320-grits. Remember to keep the workpiece moving, and use a light touch so you don't remove too much stock from one area. When you're satisfied with the results, cut off the jobber stick. (We used the bandsaw procedure shown *below* to control the workpiece throughout the cut.)

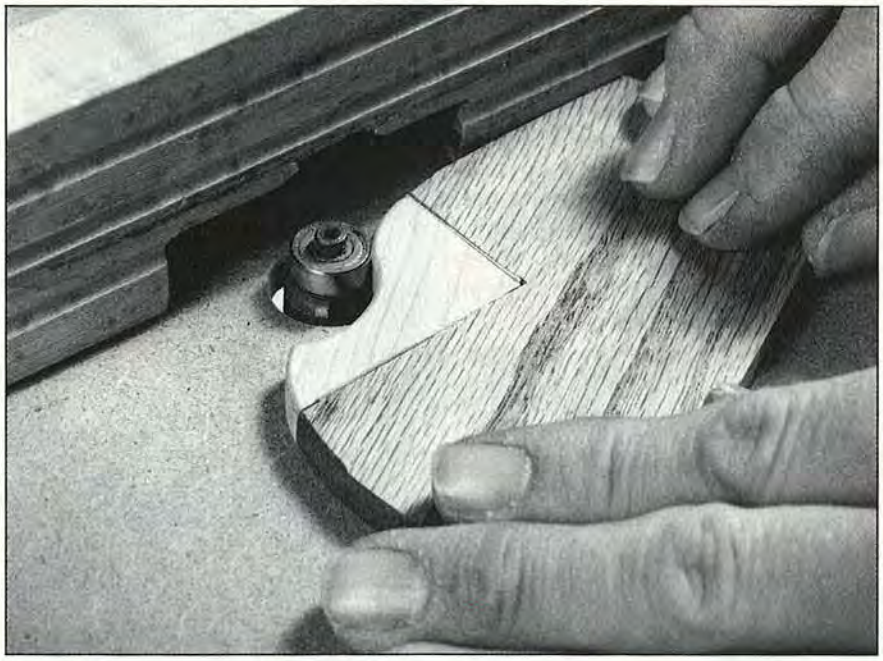
You could mount the sanding disc in a drill press, but we found it more comfortable to chuck it into a portable drill. As shown at *right*, you can make a simple clamp from a 2×4 to hold the drill horizontally in a bench vise.

If your budget allows it, you may want to buy a separate disc for each grit to save you the trouble of constantly changing grits. In our shop, we have a storage rack like the one shown on the opposite page to hold the discs and the buffing wheels we'll show you later in this article.

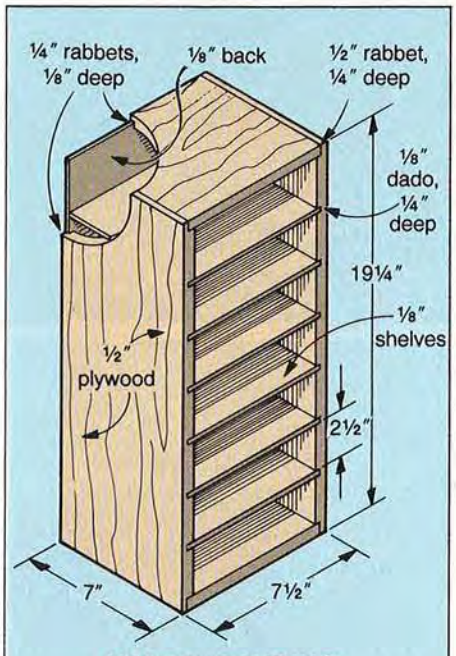
One note of caution: This methods creates loads of fine sawdust, so for health's sake wear a dust mask and position a fan to blow the debris away from you.







When the stock's too small for a jobber stick, make a carrier board of the same thickness as the stock and outline the shape of the workpiece onto it. Then, saw the carrier board to the correct shape and double-face tape it to the stock you're working. As you would do with a jobber stick, hold the workpiece or carrier board against the fence before routing. We're putting a round-over on the bracket shown at *left*, for the shelf top routed in the tip on the opposite page.



HANDY SANDING DISC STORAGE

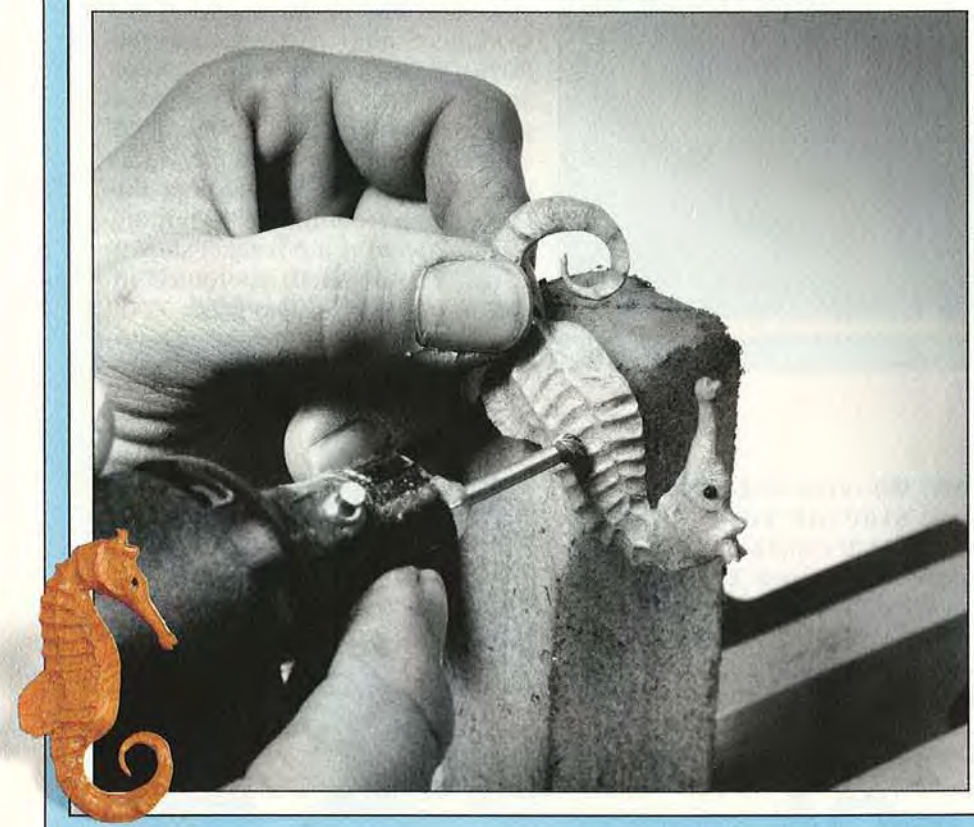
How do you clean up the back side of your shaped piece? That's simple. First, stick the workpiece to a 2–3" piece of duct tape as shown *right*. Then, form a handle with the rest of the tape and sand off the glue and stub end of the dowel with a 60-grit sandpaper disc.

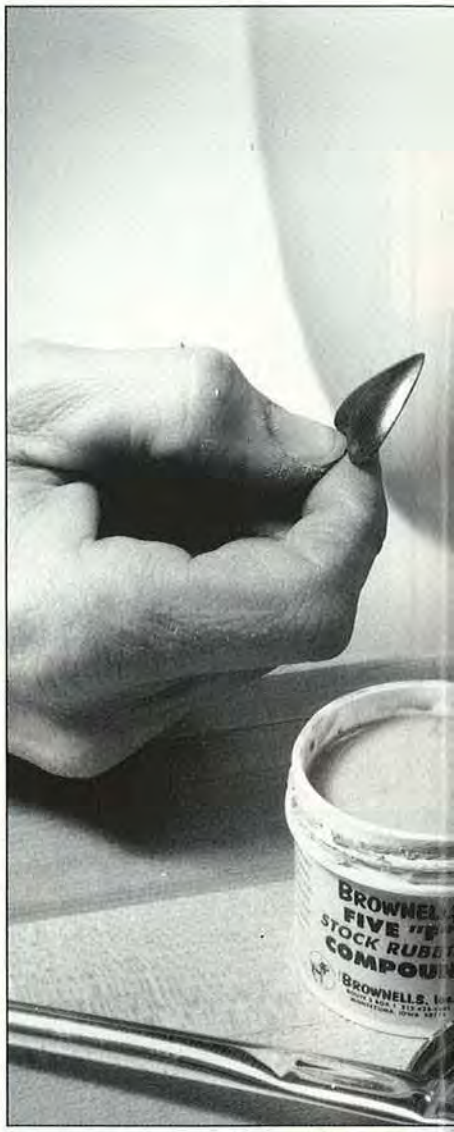
With micro-sanding discs, you can even sand in tight areas as shown at *right*. You also can purchase micro-sanding drums. See the Buying Guide on page 55 for the address of Micro-Mark.

Continued

DETAILING

Power carvers make detailing a snap, but when you work on small objects such as the seahorse shown *below,* you'll appreciate a means of supporting the workpiece. Otherwise, you could power-carve your creation into smithereens. Or, worse yet, you could carve your fingers if you hold the workpiece in your hand. Here's a cheap solution: Clamp an abrasive-cleaning stick into your bench vise and use it as a work support. The stick has a soft, nonmar, nonslip surface that gives you control over your project.





GLUING

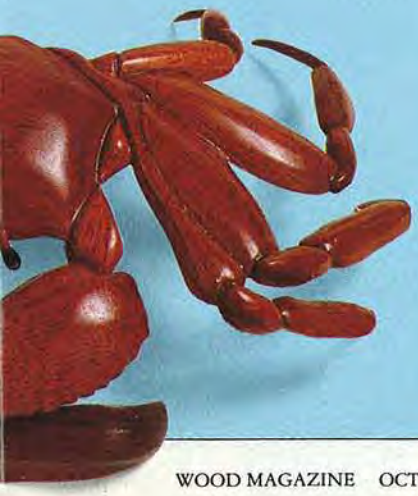
A little dab will do it when you glue together small parts, but how do you control minuscule amounts of adhesive? Paper clips and toothpicks, that's how. As shown at *right* we first placed a few drops of instant glue on a cardboard work surface, then used a paper clip to transfer the adhesive to the bracket for the shelf we made earlier. You can work a dime-sized puddle of instant glue for about 5 to 10 minutes before it sets up.

FINISHING

For a super-glossy finish, we suggest gunstock rubbing compounds in conjunction with a buffing wheel. First, you'll have to build up four to five hard coats of finish on the workpiece because this process will remove a coat or two. Then, brush some of the gritty compound onto the workpiece and gently buff it as shown at *left*. We're holding this heart by a necklace ring that we mounted to it, but you also could hold the object with double-faced tape.

We start the process by using Brownell's Triple "F" compound (see the Buying Guide *below*), then switch to Five "F" for the final polishing. Be careful not to overdo it or you'll remove all the finish. Your buffing wheels will retain some of the compound, so be careful to mark the wheels and keep them separate. Finally, rub in two coats of paste wax to enrich the lustery finish even more.

When it comes time to finish your project, try one of the two techniques shown at *left*. If your project has a hole in it, such as the eyehole in our whale, simply run a paperclip or other wire through it and suspend the piece from above. For projects such as the shelf, attach a thin dowel to an unexposed surface with hotmelt adhesive. Then, secure the dowel in a vise until the finish dries. (We prefer spray finishes for ease of application and even coverage.) Saw off the dowel and sand the glue mark.

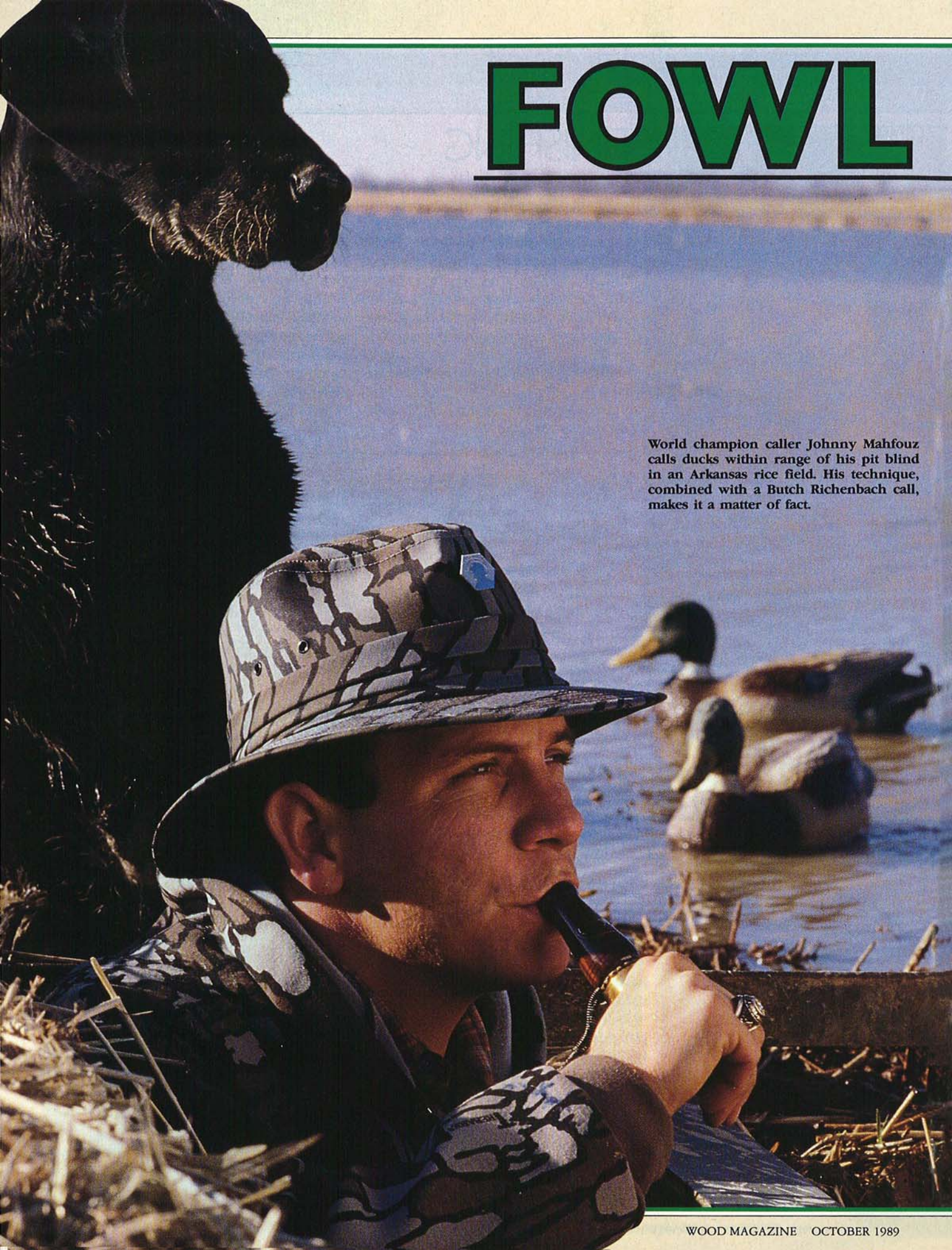


BUYING GUIDE

- **Miniature woodworking tools.** Call Micro-Mark for a free catalog at 800-225-1066 (NJ residents call 201/464-6764).
- **6" flexible spindle sanding and polishing kit.** Available from Sears stores nationwide. We paid $10.49 for ours.
- **Brownell's stock rubbing compounds,** triple "F" $3.99 ppd. for 2 oz., $6.38 ppd. for 10 oz.; five "F" $4.23 ppd. for 2 oz., $7.04 for 10 oz.; from Brownell's, Inc., 140 S. Front St., Montezuma, IA 50171. Call 515/623-5401.

Written by Bill Krier with Jim Boelling
Photographs: Hopkins Associates
Illustrations: Jim Stevenson; Mike Henry

FOWL



World champion caller Johnny Mahfouz calls ducks within range of his pit blind in an Arkansas rice field. His technique, combined with a Butch Richenbach call, makes it a matter of fact.

LANGUAGE

Duck calls from a champion of champions

Print this article

Arkansas' Quapaw Indians had no use for a duck call. According to local lore, they hollowed out huge gourds, stuck their heads in them, and then, immersed chin-deep in water, waded out to a resting flock. To bag a duck, a brave just grabbed its feet and pulled it under!

Today's duck hunter, although outfitted with a finely tuned duck call, the best of equipment, and a carefully trained retriever, often has difficulty luring birds within shotgun range. Butch Richenbach, call maker and former world duck-calling champion, has some advice.

CALLING OUT TO WINGS OVER THE PRAIRIE

Butch doesn't mind helping his friends and others become expert at what he now knows almost instinctively. After all, that's how he learned the vocabulary.

His tutor and friend was a homegrown legend: Chick Major, Stuttgart's dean of duck hunters, caller *extraordinaire*, and producer of the Dixie Mallard Call, a revered instrument known to fill hunters' daily bag limits. "I used to practically live over there," Butch recalls fondly of the Major home. "Chick was like a daddy to me, and taught me all I know about duck calls."

Butch learned well. In 1972, he called his way to the top at Stuttgart's 37th annual World Championship Duck Calling Contest, the Super Bowl of such events. Three years later, he outcalled a gathering of former champions and became a champion of champions. Since then, he's coached a string of winners. Butch ticks off the records: "I've taught the current world champion, eight junior world champions, five intermediate world champions, ten women's world champions, and two or three Arkansas state champions. They won a bunch," he says proudly, and adds, "Last year, my students won 14 out of 17 places at the world championships."

"He's not going to produce one that doesn't sound like he wants it. If he can't get the call like he wants, he'll bust it, and won't nobody get it."

As a duck-call maker, Butch also has reached the top. His calls consistently beat out all others as the favored call of world champions.

Why? "That's easy," says current champ, former student of Butch's, and Stuttgart duck-hunting guide, 30-year-old Johnny Mahfouz. "It's the craftsmanship Butch puts into every call. He's not going to produce one that doesn't sound like he wants it to sound. If he can't get the call like he wants it, he'll bust it with a hammer. If a call don't satisfy him, won't nobody get it."

THE SWEET SOUND OF WOOD

"I never intended duck-call makin' to be what it is," explains Butch about his business. "I was just doin' it for somethin' to do. Now, and I'm just guessin', I make close to 4,000 wooden calls a year."

Butch crafts calls of cedar, cherry, cocobolo, ebony, maple, Osage orange, several rosewoods, teak, and walnut. He also fashions acrylic, an ivory look-alike called Micarta, a plasticized-and-laminated

Continued

In Arkansas, they call it the Grand Prairie. The water-covered rice fields, acre upon acre of soybeans, and flooded stands of nut-producing pin oaks extend west 60 miles from the Mississippi River. Ducks on their way south consider the area an all-you-can-eat buffet. Hunters call it paradise.

Harry M. "Butch" Richenbach, *left*, grew up there. Like most of the boys in Stuttgart—the hub of Grand Prairie agriculture as well as hunting—he valued his shotgun and duck call as much as his bike and ball glove. To him, duck talk became a second language. In fact, Butch became so fluent that he eventually turned his skill into a highly specialized business.

Now, Butch, 42, makes duck calls for avid hunters wanting the best available. And, his handmade Rich-n-Tone brand calls help champion callers quack their way into the world-record books.

FOWL LANGUAGE

1. With a turning tool made from a used commercial planer blade, Butch shapes a call barrel. To make his calls, Butch relies on three Rockwell lathes.

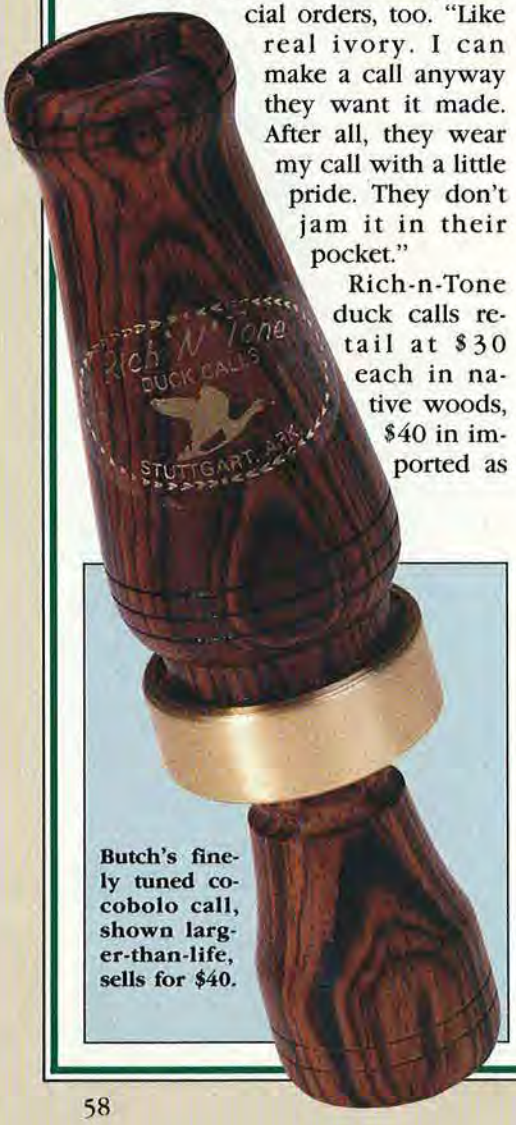
2. After scoring the barrel with a parting tool, the turner darkens the decorative lines by scorching them with a fine wire held tightly to the wood.

3. To allow air to flow against the reed, Butch drills a hole in the throat of the endpiece with a portable electric drill and a ¼" brad-point bit.

wood named Dymondwood (similar product to Pakkawood, often used for knife handles), and Corian, a kitchen-countertop material, into duck calls.

He does out-of-the-ordinary special orders, too. "Like real ivory. I can make a call anyway they want it made. After all, they wear my call with a little pride. They don't jam it in their pocket."

Rich-n-Tone duck calls retail at $30 each in native woods, $40 in imported as well as laminated wood, and $100 each in the synthetic materials. "The higher cost is partly the materials, but acrylic calls, for instance, take a long time because I have to shine 'em back up to take out the scratches," explains Butch.



Butch's finely tuned cocobolo call, shown larger-than-life, sells for $40.

A stickler for correct sound, Butch prefers some woods over others for his calls. "A few woods can lose their tone, you know, dependin' upon how much you use the call. It could take 10 years, could be five. It's hard to say. Probably due to density. It seems, usually, that the harder the wood the better the tone. I like cocobolo, because like teak, it tends to be oily," he continues. "That makes it resist collectin' moisture from your mouth, which deadens the tone."

Yet, despite his theories and calculated choices, wood still pulls strange tricks on the call maker. "You know, you can make two calls from the same block of wood—wood that was side by side—and one will go like heck and the other won't," Butch says, pushing a finger under his cap to scratch in wonderment. "You never have any say over it."

DUCKS DON'T NOTE SHAPE

Lots of people assume that a duck call's shape has much to do with its sound. Well, forget that notion. "Shape? Naw, it's just like a lot of things—depends on who's making it," Butch practically guffaws. "I come up with that design of mine by thinkin' about a Coke bottle. I put that lip on, and made it shorter than most, about 5" long."

In the duck-call trade, where former champions and top guides all produce calls and vie for part of a specialized market, hunters scrutinize new calls. "When I first made it, everybody laughed at me 'cause it was smaller," Butch remembers. "But I told them 'What makes you think a duck call has to be big?' A duck don't fly by and say 'He's blowing a big duck call, I'll go in there!' Calls used to be at least an inch longer than mine."

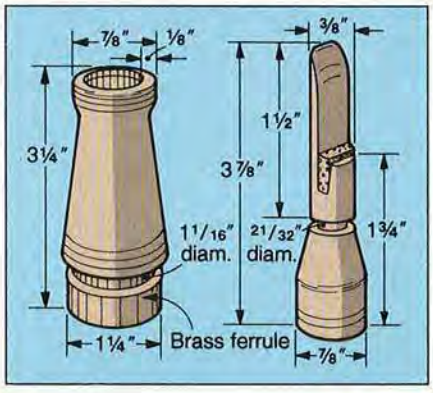
Hunters should appreciate his call's size reduction. As Butch says, "Take going huntin'. You got a 12-pound gun, a pair of waders, a huntin' coat, two boxes of shells—all you need is a two-pound call hangin' around your neck."

MOONLIGHTING THE CALLER'S CALL

By day, Butch runs the Stuttgart Youth Center Inc., a job he loves nearly as much as duck calling. By night, though, you'll find him in his 24×48′ metal building behind Mac's Sport Shop, turning out calls.

"A call doesn't have to be smooth, you could whittle one out," advises Butch as he sets up to turn at the first of three lathes. His calls, however, don't look rough at all. In fact, they're not only finely finished but of such uniform dimension one to another that it's hard to believe they're handcrafted.

4. Butch's work-worn hands perform the delicate work of tuning a call. For proper sound, the cork, shaved to fit, must hold the Mylar reed exactly right.



"I do make 'em one at a time, though," he advises. "But, I make maybe 10 or 12 mouthpieces, or barrels [see drawing, *right*, illustrating parts of a duck call], then I go make 10 or 12 ends."

And, Butch, with the sharp eye of a marksman, never relies on measuring devises or templates. "I got something to measure with, but I don't use it. As far as the shape, I don't need a pattern. I just look at it. And, they'll all be exactly alike."

To make a barrel, Butch starts with a piece of 1½"-square stock about 3" long. He chucks it on the lathe, then rounds it, trimming one end down to accept a brass ferrule. Then, he removes the barrel from the lathe, presses on the ferrule, and pins it in place. At the next lathe, see photo 1, *opposite page*, he completes the shaping, sands the wood, cuts in the trim, and seals it with orange shellac, which, Butch says, helps the finish adhere.

To darken the trim lines, Butch burnishes the cuts with a piece of fine wire, holding it in the grooves until the spinning wood smokes, as shown in photo 2, *opposite*. At the drill press, he bores out the center with a ¾" bit.

The shorter endpiece begins as 1⅛"-square stock. At his third lathe, Butch quickly turns it to shape, sands, and wipes it with shellac.

Then, he clamps the endpiece in a jig, and at his bandsaw, cuts away the section where he installs the reed and block. Next, he positions the wood in a vise and drills it with a ¼" bit for the air passage, as shown in photo 3, *opposite*.

With his stepped-up, production-like technique, Butch can craft a wooden call in less than 10 minutes. Even tuning, the most important step of all, takes little time in the expert's hands.

TO TALK LIKE A DUCK

Tuning a call to the perfect pitch begins with a minutely thin Mylar 1000A (about .01") reed placed in the notch of the endpiece. To hold the reed in place, Butch wedges in a tiny cork stopper. With a bench knife, he trims the cork and the edges of the reed, as in photo 4, *above*. Now, the critical moment. "After that it'll blow—or it's supposed to," he laughs.

Actually, tuning a duck call isn't difficult. It follows simple guidelines: The longer the reed, the deeper the sound and the harder the call is to blow. To make a louder, easier blowing call, just shorten the reed by a hair. But, shorten it too much and you'll get a squeaky call. Yet, every call Butch makes must satisfy his ears first—the main reason for Butch's reputation.

Butch's duck calls won't do the job all by themselves, though. "The call's got a heck of a lot to do with it," notes Johnny, "but you have to know the right way to put the calls in to get them out."

So, what goes in? "Words, that's all," says Butch. "If you want to sound like a duck, you got to talk like a duck. If you think a duck says 'quack,' then you say 'quack.'

"You gotta find the right word, cause the same word don't fit everybody," the master caller advises. "Like 'hoot' for instance. It ain't 'hoot' when you blow in a duck call, it's 'oot.' You have to drop the first letter off."

To be a successful duck hunter, then, you combine the correct language with the right call. Ask Butch for the words. He'll tell you. But he won't insist you buy one of his calls. "I don't tell anybody that my duck call is better than anyone elses, because I don't know for sure that it will call a duck better. I just leave that judgment up to other people. I'm prejudiced, anyway."

Want to learn how to blow a duck call by listening to a pro? Butch has recorded a short instructional cassette tape packed with sounds you need to know. For a copy, send $12 ppd. to: ***Duck Tape, Rich-N-Tone Duck Calls, Dept. WD, 1010 North Grand, Stuttgart, AR 72160.***

Written by Peter J. Stephano
Photographs: Bob Hawks
Illustration: Mike Henry

BUILD THIS TERRIFIC TABLESAW HELPER FOR UNDER $50

RIGHT-ON RIP FENCE

If you're looking for an inexpensive way to upgrade your tablesaw, you've turned to the right pages. After using accurate aftermarket fences, we challenged our own Jim Downing to design a wooden replacement fence for the readers who like to build their own workshop tools *and* save a bundle of money in the process. Less than 12 hours later, Jim emerged from his workshop, proudly hugging his prototype.

We think Jim's design will please you, too. For less than $50, you can have the smooth-sliding, easily adjustable fence that you've always dreamed of.

Print this article

***Note:** We designed our replacement rip fence to fit a Sears 10" motorized tablesaw. Some dimensions may vary for different tablesaws.*

ACCURACY BEGINS WITH THE FRONT RAIL

1 From ¾" birch, rip and crosscut three pieces 1¾" wide by 53" long for the replacement guide rail (A). With the edges and ends flush, glue and clamp the pieces face to face.

2 Later, remove the clamps and scrape off the excess glue.

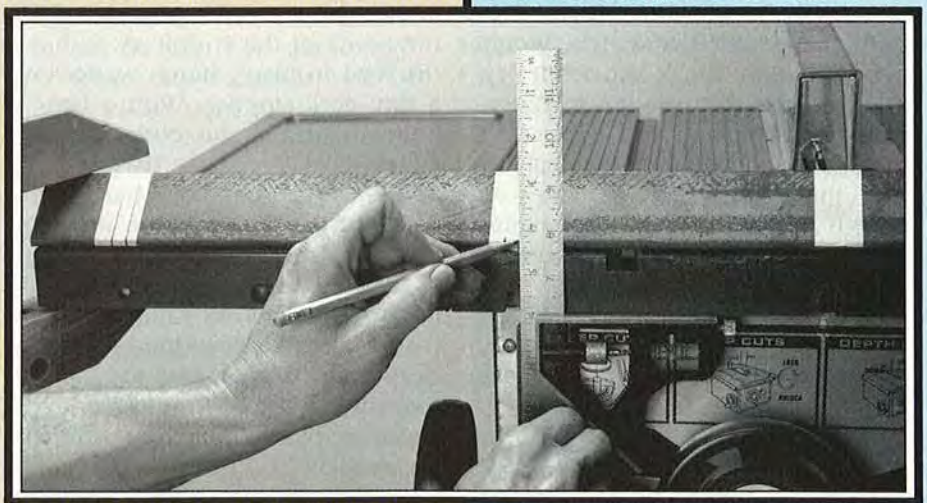
3 Remove the existing front rail from your tablesaw.

4 Using a hacksaw, cut a piece of 2×2" angle iron to 53" long.

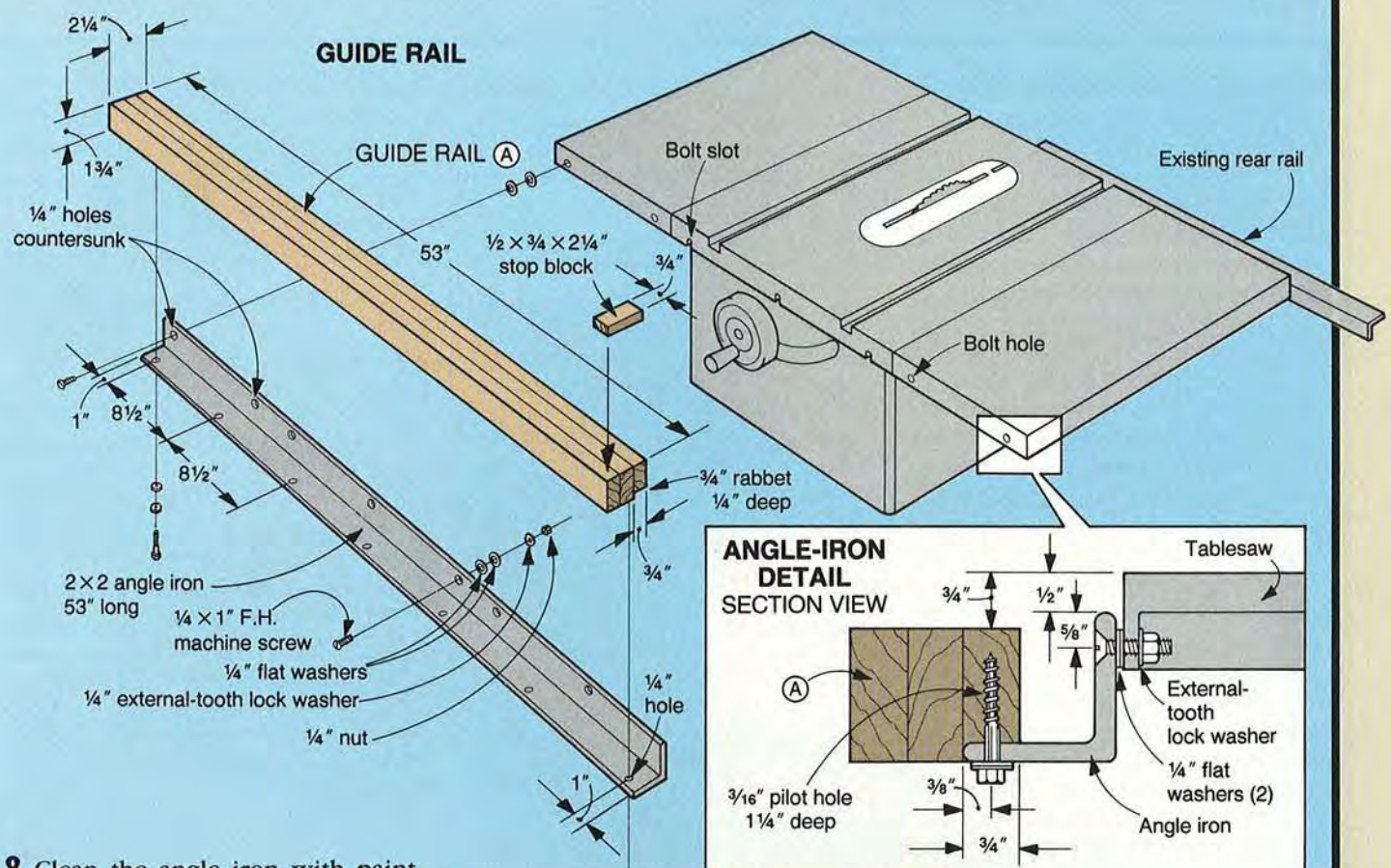
5 With the left end of the angle iron flush with the left end of the tablesaw extension, clamp the angle iron to the saw table as shown in the photo *below.*

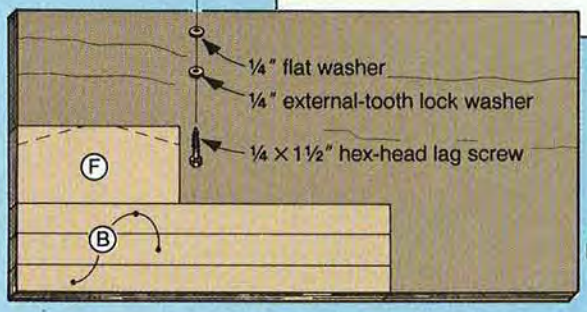
6 Apply masking tape to the angle iron directly above each bolt hole and slot. Using a square, transfer the tablesaw hole and slot locations onto the tape as shown in the photo *below.* Remove the angle iron.

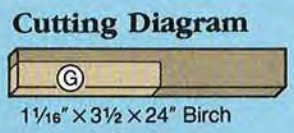
7 Drill and countersink ¼" holes through the angle iron, centering each hole between the lines and ⅝" from the top edge of the angle iron. See the Angle Iron Detail on the opposite page for reference.



▼ Clamp the angle iron to the saw table, and transfer the hole and slot locations from the saw table to the angle iron.







¾ × 24 × 48" Birch Plywood

¾ × 7¼ × 72" Birch

8 Clean the angle iron with paint thinner, sand it smooth, and spray it with rust-resistant black paint.

9 For your fence system to perform correctly when completed, position the top edge of the guide rail (A) ¾" below the top surface of the saw table. To achieve this with our guide rail, we cut a ¾" rabbet ¼" deep along one edge of the rail where shown on the Guide Rail Drawing and accompanying Angle Iron Detail. Your rabbet depth may vary to achieve the ¾" spacing.

10 Clamp the angle iron to the rabbeted recess where shown on the Angle Iron Detail. Now, drill seven additional ¼" holes through the angle iron where shown on the Guide Rail Drawing *above*. Switch bits and drill 3/16" pilot holes 1¼" deep into the guide rail.

11 Using ¼ × 1½" lag screws, fasten the angle iron to the guide rail.

12 With ¼ × 1" flathead machine screws, fasten the angle iron to the saw table, using two ¼" washers as spacers (see the Angle Iron Detail). Check that the guide rail is parallel with the saw table.

Bill of Materials

	Part	Finished Size T	W	L	Mat.	Qty.
A	guide rail	1¾"	2¼"	53"	LB	1
B	fence	¾"	2½"	32"	P	3
C	locking lever	¾"	1½"	4¼"	B	1
D	connect block	¾"	½"	5⅛"	B	1
E	finger clamp	¾"	1 1/16"	3¾"	B	1
F	head block	¾"	6¼"	13¾"	P	1
G	aligning block	1 1/16"	2¼"	13¾"	B	1

Material Key: LB-laminated birch, P-plywood, B-birch

Supplies: ¼ × 2 × 2" angle iron 53" long, masking tape, paint thinner, rust-resistant black spray paint, ¼ × 1" flathead machine screws (7), ¼" flat washers (23), external-tooth lock washers (14), ¼" nuts (9), ¼ × 1½" hex-head lag screws (7), ¼ × 1½" hex-head machine screw and lock nut, ¼" threaded inserts (2), ⅜" dowel stock, 1½ and 2½" drywall (case-hardened) screws (4 each), finish.

RIP FENCE

CUT AND LAMINATE THE FENCE PIECES

1 Cut three pieces of ¾" plywood (we used birch plywood) to 2½×32" for the fence parts (B).

2 With carbon paper or a photocopy, transfer the cutlines from the Mechanism Opening Drawing to the left end of one plywood strip.

3 Saw along both cutlines to cut the pieces (we used a bandsaw).

4 Position the support block on one of the remaining fence pieces where dimensioned on the Mechanism Opening Drawing. With the bottom edges flush, glue and clamp the support block to the outer fence part where shown on the drawing. Glue and clamp the remaining inner fence part to the same outer fence part where shown on the drawing. Remove any excess glue from the opening.

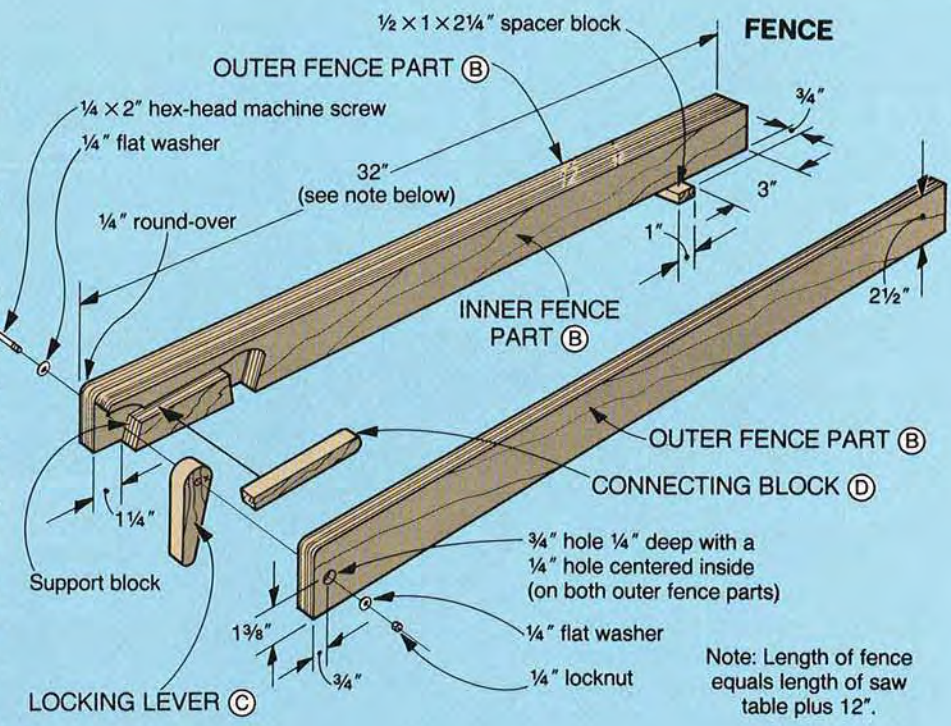
5 With the edges and ends flush, glue and clamp the remaining fence part to the assembly. Be careful not to get any glue in the cutout area. Later, sand a ¼" round-over along the top front edge where shown on the Fence Drawing.

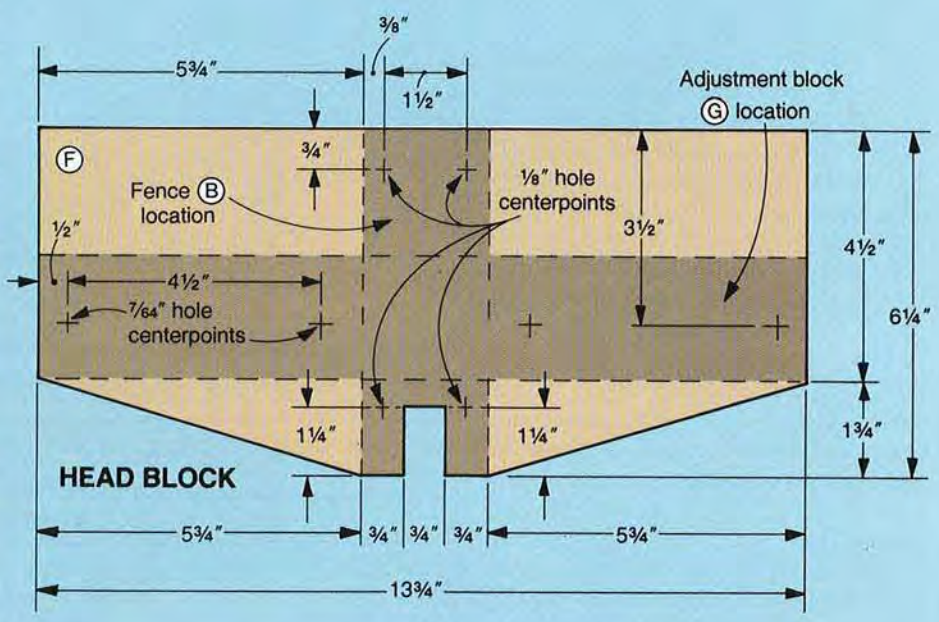
6 Drill a ¼" hole through the fence assembly where dimensioned on the Fence Drawing. Now, bore a ¾" hole ¼" deep and centered over the ¼" hole on both faces of the fence rail (we used a Forstner bit).

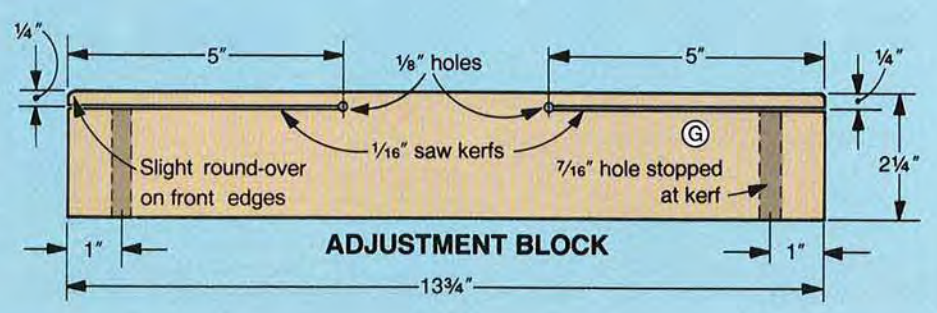
THE LOCKING MECHANISM HOLDS IT IN PLACE

1 Transfer the full-sized patterns and hole centerpoint of the locking lever (C), connecting block (D), and finger clamp (E) to ¾" solid birch with carbon paper or by adhering a photocopy to the stock. Bandsaw the pieces to shape. Mark an X on the lever where shown.

2 Drill a ¼" hole through the locking lever where marked. Slide the connecting block in place and bolt the lever in position. Locate the edge with the X next to the connecting block where shown on the Fence Drawing. To keep the lever moving freely, don't overtighten the nut on the machine screw. Slide the finger clamp in place.







CONSTRUCT THE FENCE-HEAD ASSEMBLY

1 Using the Head Block Drawing for reference, mark the outline, notch, and the eight centerpoints for the head block (F) on ¾" plywood. Bandsaw the head block to shape and sand smooth.

2 For mounting the fence to the head block later, drill four ⅛" holes where shown on the Head Block Drawing. Now, drill four 7/64" holes through the head block at the remaining marked centerpoints.

3 Cut the alignment block (G) to size. Using the Alignment Block Drawing for reference, transfer the ⅛" hole centerpoints and kerf locations to the block. Drill the two ⅛" holes where marked. Now, position your bandsaw fence 2" from the blade. Start at one end and cut to the ⅛" hole. Stop the saw, and back the piece away from the blade. Switch ends, and cut to the other ⅛" hole as shown in the photo *below left.* Sand a slight round-over on the front edges of the block where shown on the drawing.

4 Position the alignment block on edge with the kerfed edge on your workbench. On the opposite edge, mark the 7/16" hole locations for the threaded inserts where shown on the Alignment Block Drawing. Drill 7/16" holes 2" deep, centered from edge to edge (stop drilling when you reach the bandsawed kerf).

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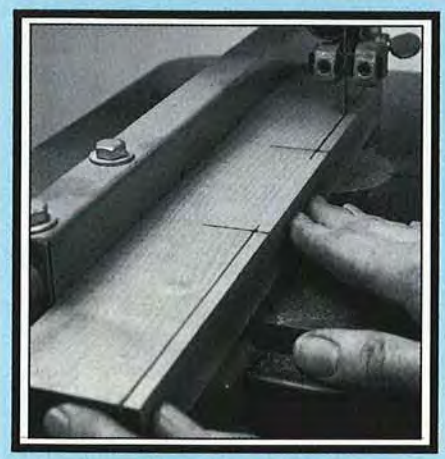
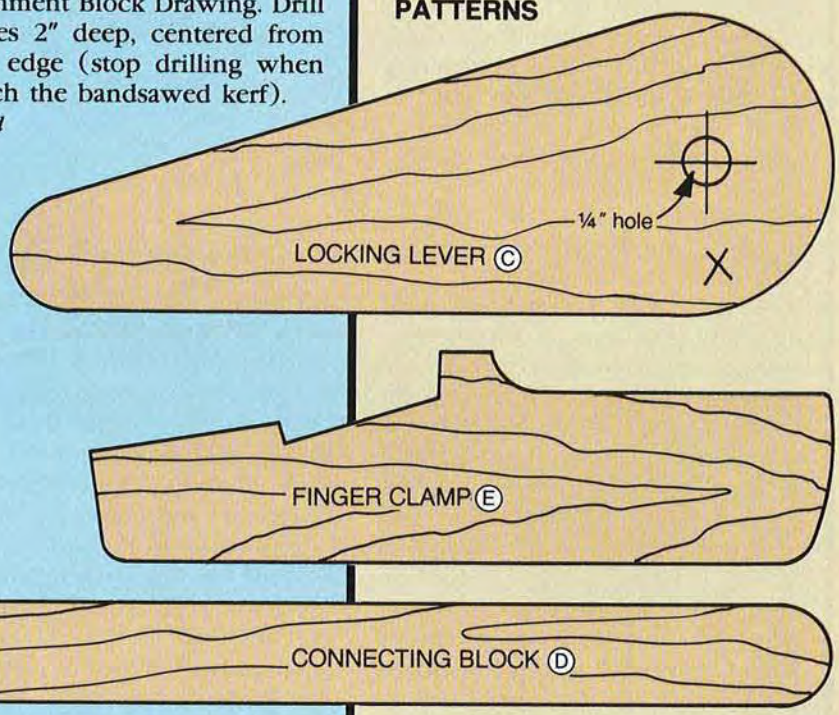


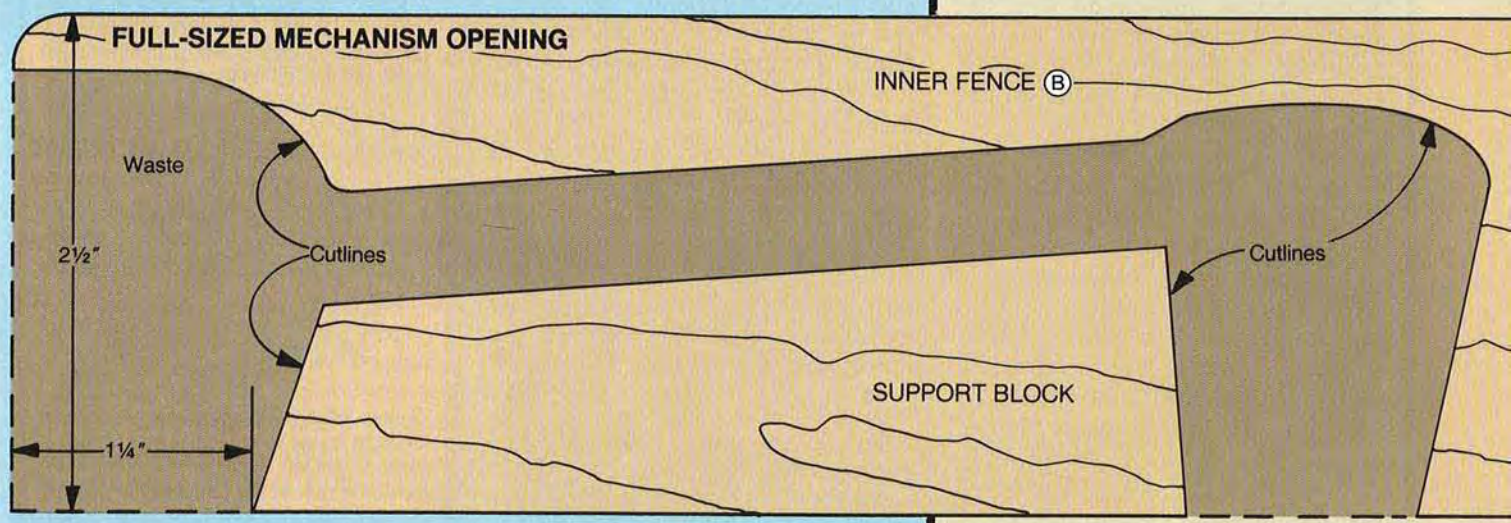
Position the fence and align the blade with the center of the ⅛" holes. Bandsaw to the holes to form a pair of kerfs in the alignment block.

Smooth ripping cuts require that the fence be parallel with the saw blade. The fences that come with many saws are hard to adjust and keep aligned with the blade. Our homemade-fence adjusts easily and locks down firmly.

A. R. Downing
Design Editor

FULL-SIZED PATTERNS





RIP FENCE

5 Cut two pieces of ⅜" dowel 1¼" long and slide one into each 7⁄16" hole in the alignment block. Wax the threads of two ¼" threaded inserts, and screw the inserts into the 7⁄16" holes in the adjustment block. Thread a ¼" nut on each of the two ¼ × 1½" hex-head screws. Thread a screw into each insert.

6 Position and clamp the alignment block to the bottom side of the head block. (See the Head Block Drawing for location.) Using the previously drilled 7⁄64" holes as guides, drill 7⁄64" holes ¾" deep into the alignment block. Screw (no glue yet) the alignment block to the bottom side of the head block.

7 Position and clamp the fence head (F, G) to the bottom side of the locking end of the fence (B), *carefully* checking for square. Using the previously drilled ⅛" holes in the head block as guides, drill ⅛" holes 1¾" deep into the bottom of the fence. Screw the assemblies together as shown on the photo at *right*.

8 Position the fence assembly on the guide rail and check that the locking mechanism secures the fence to the guide rail. If not, you may need to take the head assembly apart and shorten or lengthen the connecting block accordingly. Now, glue and screw the assembly back together, checking for square.

9 Cut a ½ × ¾ × 2¼" stop block to size, and glue and clamp it to the guide rail where shown on the Guide-Rail Drawing. The block keeps the fence from sliding off the end of the rail.

ADD THE FINISH AND ADJUST THE FENCE

1 Mask the angle iron, and apply polyurethane to the fence assembly and guide rail. Later, after the finish has dried, remove the tape.

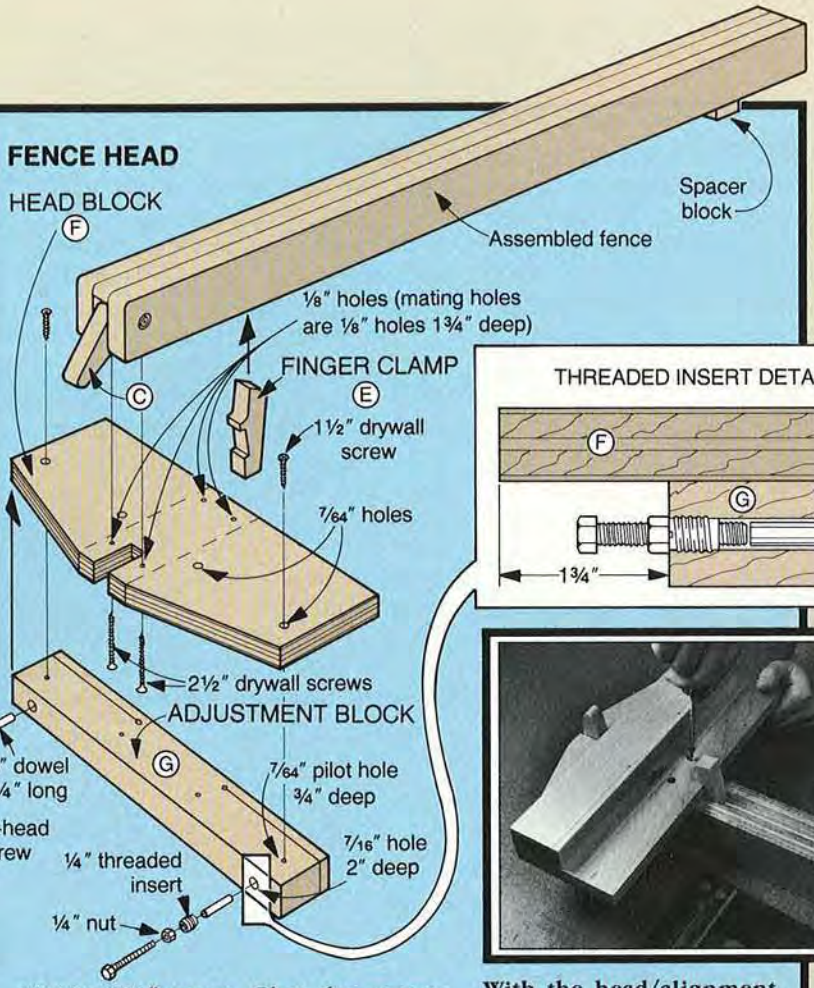
2 Move the existing rear rail so the left end of the rail aligns with the saw blade where shown on the Guide-Rail Drawing.

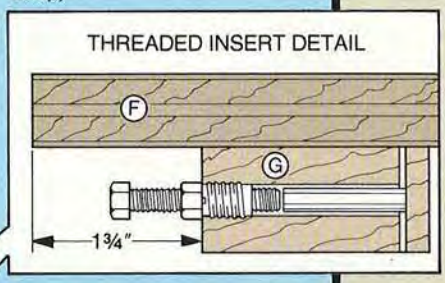
3 Position the fence assembly on the saw table and guide rail. Cut a ½ × 1 × 2¼" spacer. Glue the spacer to the bottom of the fence so the spacer rides on the rear rail. See the Fence Drawing for reference.

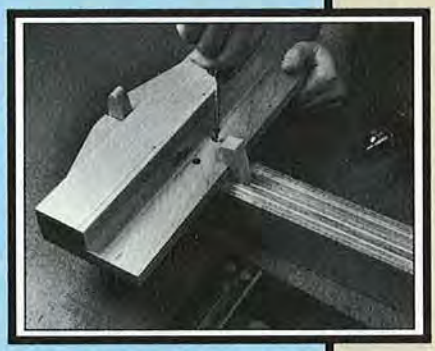
4 Elevate your tablesaw blade as high as it will go. Slide the fence next to the blade. Using the drawing *below right* for reference, adjust the hex-head screws to align the fence parallel with the blade. Push the lever down, check the fence alignment to the blade, pull the lever up, adjust the screws, and recheck the alignment. Snug the ¼" nut on each screw against the ¼" threaded insert.

5 Refer to the drawing at *right* to secure the fence to the guide rail. When cutting plywood and other large pieces, position the fence, lock it in place, and clamp the end opposite the lock mechanism to the existing rear rail. This prevents the fence from flexing out of square.

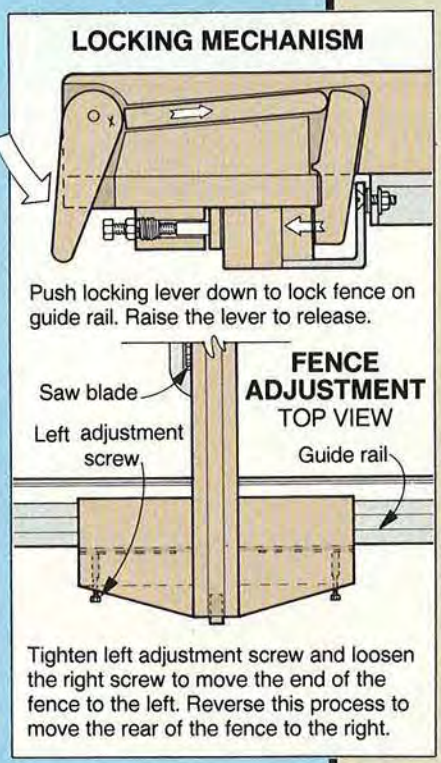
Produced by Marlen Kemmet
Project Design: James R. Downing
Photographs: Hopkins Associates; Jim Kascoutas
Illustrations: Kim Downing; Mike Henry







With the head/alignment block assembly square with the fence, glue and screw the parts together.

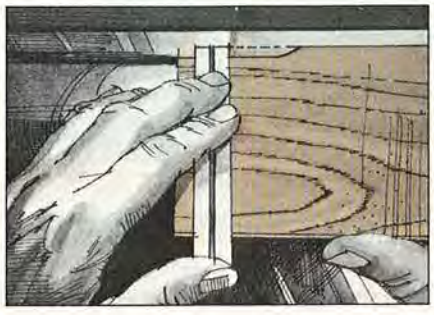

LOCKING MECHANISM
Push locking lever down to lock fence on guide rail. Raise the lever to release.
FENCE ADJUSTMENT
TOP VIEW
Saw blade
Left adjustment screw
Guide rail
Tighten left adjustment screw and loosen the right screw to move the end of the fence to the left. Reverse this process to move the rear of the fence to the right.

HOW TO SAFELY FEED STOCK THROUGH A JOINTER

Print this article

In knowledgeable hands, a jointer can make quick work of planing the edges and surfaces of boards. Here's how to get the job done correctly.

1 For most jointer operations, you'll set the fence at 90°. To check this angle, place a try square on the outfeed table as shown *above*, then adjust the fence until daylight disappears between the square's blade and the fence.

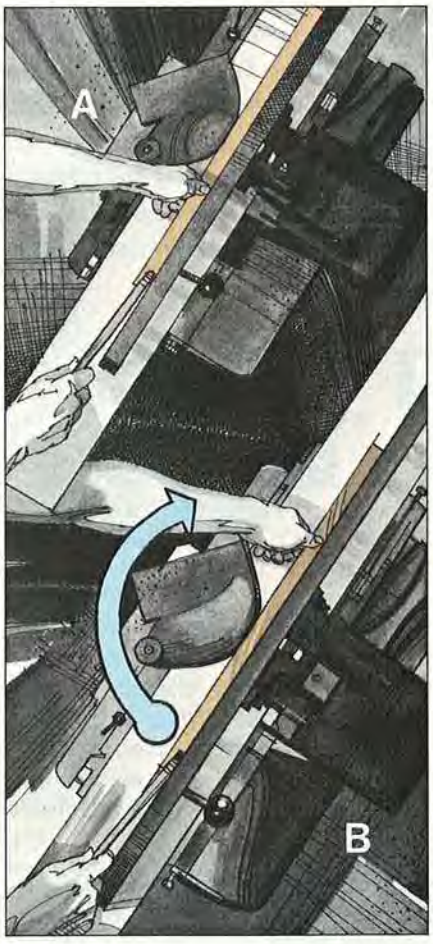


2 Next, make a 1"-long, ⅛"-deep test cut on a piece of scrap stock. Lay the cut edge of the scrap piece against the fence as shown *above*, and check the depth of cut with a rule. Set your depth-of-cut scale according to this test cut.

3 For a smooth cut, position the workpiece so its grain runs downhill from the outfeed table as shown *above*. If the grain runs every which way, position the board so the majority of the grain flows in the correct direction, take a shallow cut (about 1/32"), and be sure to feed the stock slowly.

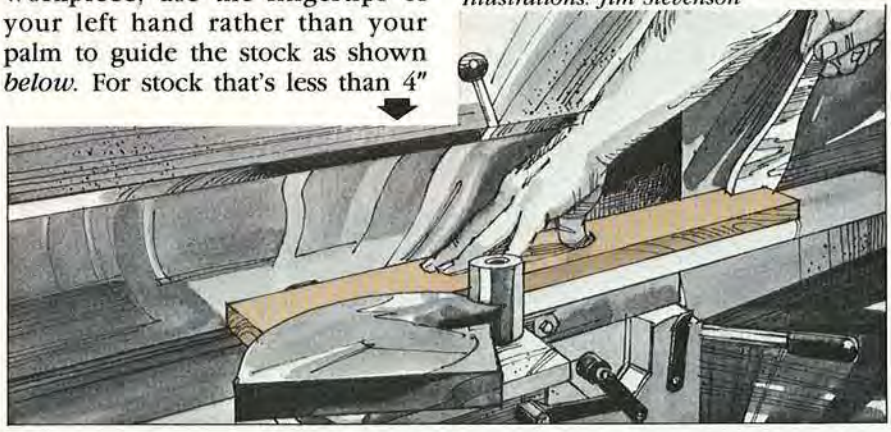
4 When jointing edges, hold the surface of the board flat against the fence with your left hand and feed the board with your right hand. Keep your left hand behind the cutterhead as shown in drawing *A*.

With the board halfway across the cutterhead, swing your left hand around the blade guard as shown in drawing *B*. Now, place lefthand pressure down onto the outfeed table and toward the fence.



5 To remove stock from surfaces, move your hands in the same motion as described in step 4. To control the workpiece, use the fingertips of your left hand rather than your palm to guide the stock as shown *below*. For stock that's less than 4" wide, use a push block to control the stock with your left hand. Be sure to clear any dust from the bottom of the block for a good grip.

Illustrations: Jim Stevenson



JOINTERS

Although some woodworkers consider a jointer to be a luxury item, a slew of us would feel lost without this machine in our workshop. Why? No other tool matches a jointer's ability to quickly cut a true, baby-skin-smooth edge at a precise angle.

Just as the tablesaw has replaced the handsaw for many woodworking tasks, so has the jointer sidelined the hand plane for many edge- and surface-preparation jobs. But, this versatile tool's usefulness doesn't stop there. You can even use it to cut tapered legs, chamfers, rabbets, and tenons.

Today, most of the jointers produced for the home-workshop market have 6⅛"-long knives, meaning that they will cut a 6⅛"-wide swath. Although you could purchase a 4" or 8" model (see the box on page 68), we will concentrate on the price-competitive 6" market. In this range you will find plenty of models under $400, including the nine we tested in our *WOOD®* magazine shop.

STRAIGHT FACTS ABOUT HOW A JOINTER WORKS

To understand how a jointer works, think of it as a motorized hand plane turned upside down. In place of the plane's sole, jointers have two *tables:* one for *infeed* of the workpiece, and one for *outfeed* as shown at *right*. Between the tables sits a rapidly rotating *cutterhead* containing two or three knives.

To pass a workpiece over the cutterhead, you normally set the infeed table from 1/32" to ⅛" below the top of the cutterhead, depending on how much stock you want to remove with each cut. The outfeed table sits flush with the top of the cutterhead. Combined, the infeed and outfeed tables make up the *bed* of the jointer. As you pass a workpiece across the bed, the knives remove the desired amount of material. During the cut, you hold the stock firmly against a *fence* that adjusts from 90° to 45°, producing a square or beveled edge.

Although some manufacturers tout depth of cut as an important asset, we feel it's an oversold feature. Why? Unless you use your jointer for making rabbets—a procedure we feel is better suited to a tablesaw or router table—you'll never need to remove more than 1/16" of stock in one pass.

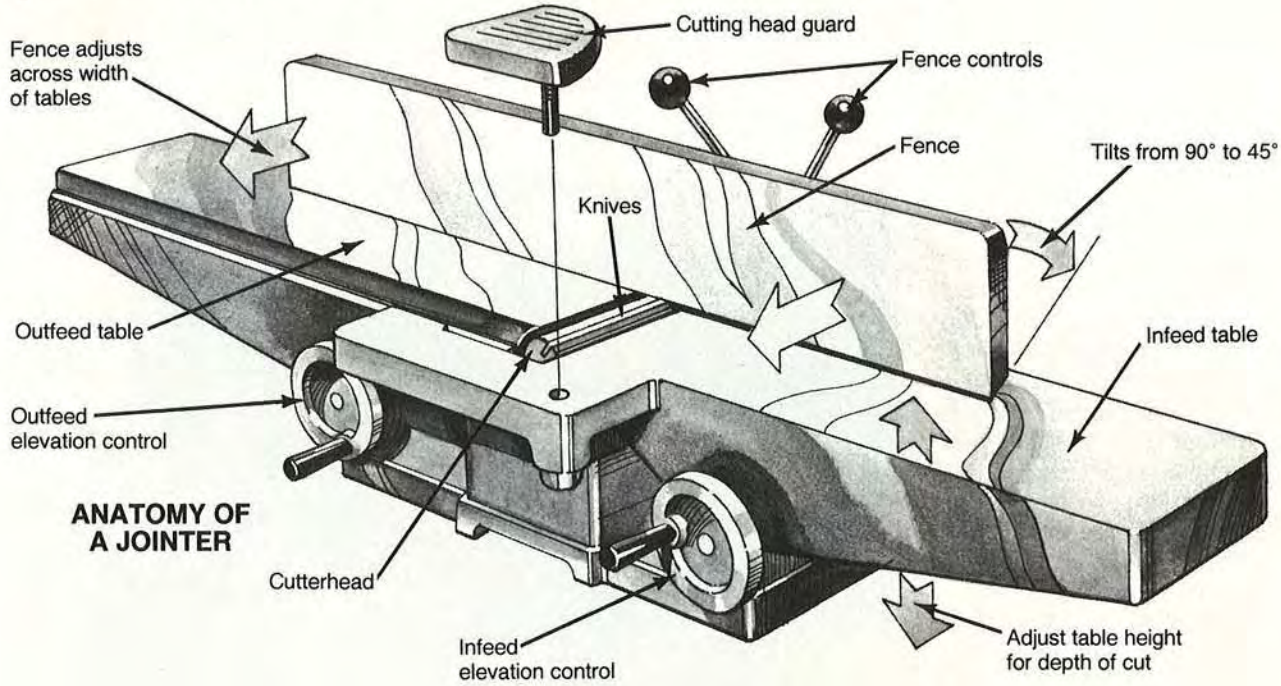
ADJUSTMENTS: WE PREFER KNOBS AND CRANKS

Of the few controls on a jointer, you'll adjust the infeed elevation control more than any other. For this frequent change, we preferred the smooth and accurate crank-type controls found on most of the machines. Many manufacturers place this crank directly underneath the infeed table, but Jet wisely positions both the infeed and outfeed controls on the front of its model JJ6, making them easier to reach.

Continued

Print this article

MACHINES THAT GIVE YOU THE EDGE QUICKLY AND ACCURATELY



ANATOMY OF A JOINTER

Opposite left: Foley-Belsaw model 445, Grizzly G1182, and Total Shop 915.

Near left:: Sears model 23220, Jet JJ6, and Delta 37-280.

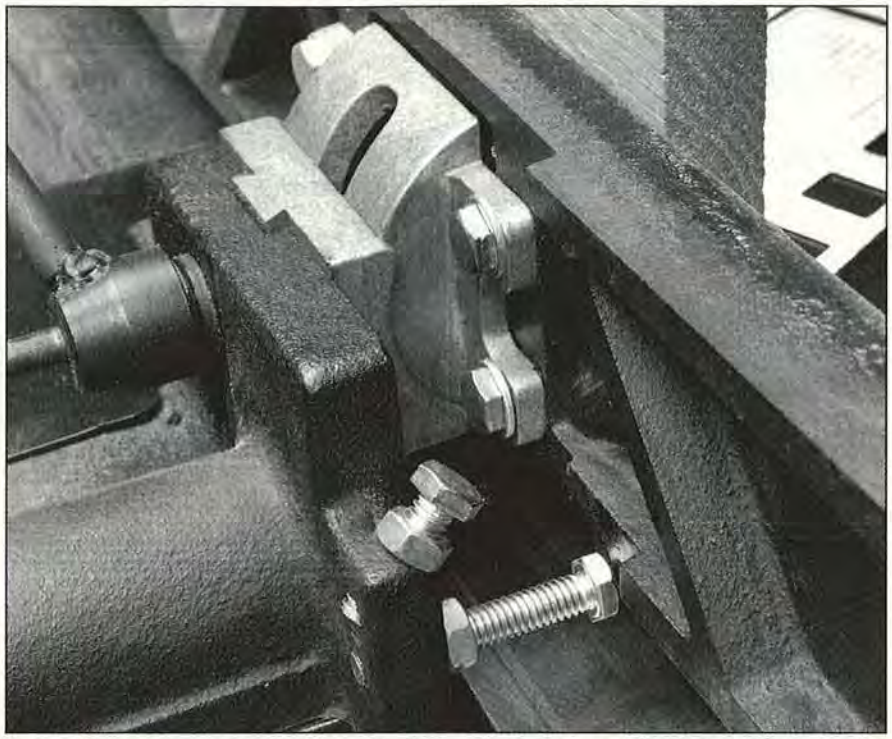
JOINTERS

The knob controls on the Delta 37-280 and Sears 23220 work much like the cranks. Similar in purpose, but different in design, the lever-operated controls on the Grizzly G1182 allow you to quickly adjust the tables up and down. However, our tests showed these levers make fine-tuning for a precise depth of cut difficult, and actually prolong the adjustment time.

With the exception of the Sears 23220, Delta 37-280, and the Ryobi JP-155, all the machines we tested had adjustments for the elevation and leveling of the outfeed tables. However, since all of the tables were true and level on the models called in for our tests, a lack of outfeed table adjustments does not appear to be a liability. In fact, we've never had to adjust the outfeed table on a Delta 37-150 during two years of service in our shop.

The infeed table, on the other hand, will take a pounding over time from dropped boards that could force it out of level. With the exception of the Ryobi JP-155, all the machines have infeed-table leveling controls. Al Nielsen of Ryobi says his company doesn't see a need for such adjustments because "our high-tech die-casting process enables us to maintain very tight tolerances and plenty of strength in the infeed table." We agree with Nielsen's assessment of the machine's high-quality castings, but we still would advise you to avoid dropping any heavy boards on this machine's infeed table.

Besides infeed-table adjustments, you'll also find yourself frequently adjusting the fence in two ways: across the width of the cutterhead to wear the knives evenly, and tilted for bevel cuts. We prefer fence controls located at the center of the fence to those mounted at the end of the fence such as on the Sears 23220 shown at *bottom* and the Total Shop 915. We found that the center-mounted controls adjust faster and lock the fence more securely. Among the centered controls, we appreciated the simplicity of the positive 90° and 45° stops common to the Jet JJ6 and Foley-Belsaw 445 as shown *below.*

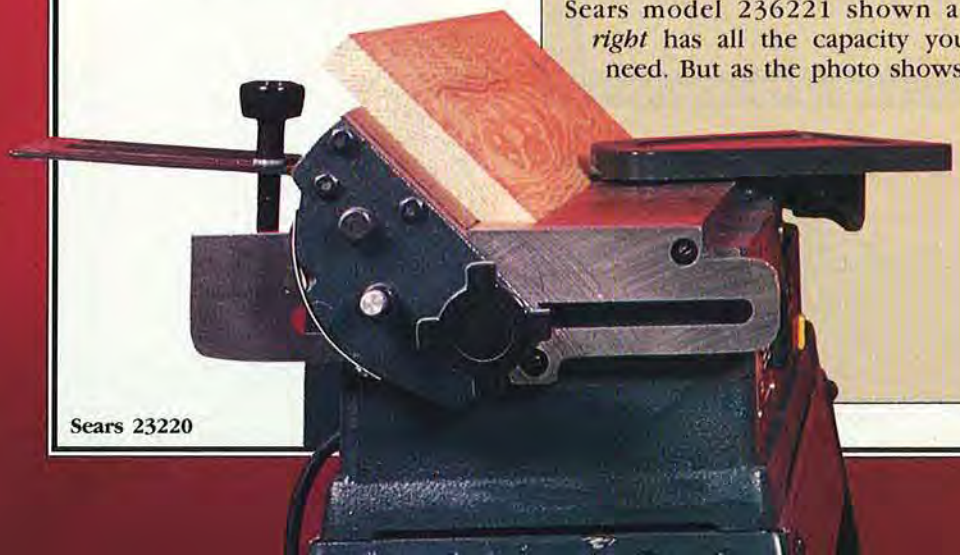


Two bolts serve as quickly adjustable 45° and 90° stops on the Foley-Belsaw model 445, *above,* and the Jet model JJ6: a simple and efficient system.

CAPACITY: HOW MUCH JOINTER DO YOU NEED?

Since you'll use a jointer mostly for edge work, you might think that a 4" machine such as the Sears model 236221 shown at *right* has all the capacity you need. But as the photo shows, the differences between 4" and larger jointers goes well beyond the length of their knives. Most importantly, the majority of 6" jointers have 40" or longer beds and 28" or longer fences that allow you to comfortably joint stock up to 6' long. With a bed length of only 21½" on the Sears model, you'd have a hard time jointing boards longer than 4'.

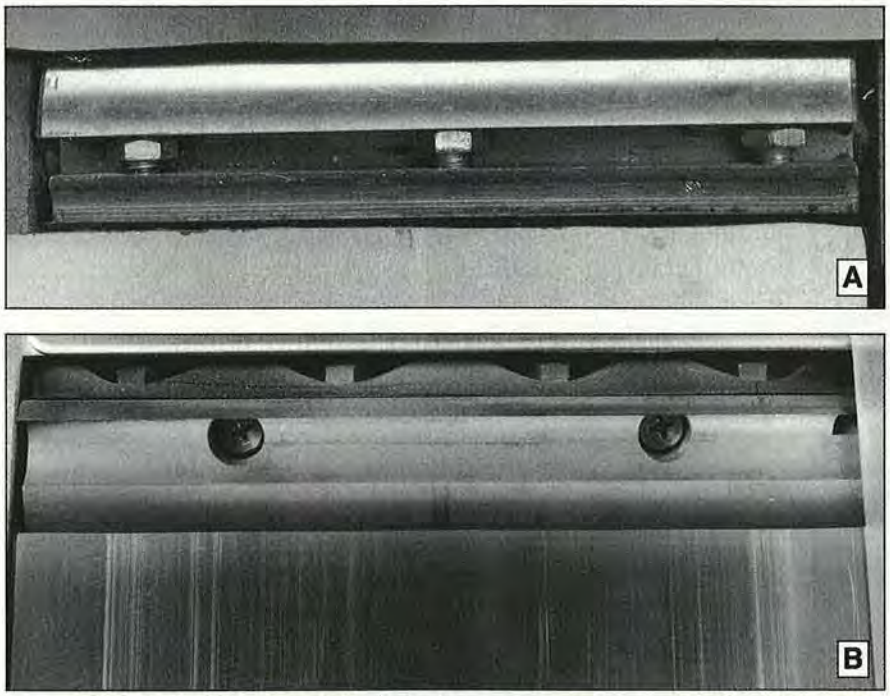
Here's some good news if you joint stock over 6' long: You can now buy Taiwanese-made 8" jointers for under $1,000. For example, the Grizzly model G1018 shown at *right* sells for $665 plus shipping and has a 65½" bed.



Sears 23220

CHANGING KNIVES: SHEAR DELIGHT ON SOME MODELS

Nothing will hurt the performance of your jointer more than dull knives. And, when it's time to resharpen them, you'll think highly of a machine that makes removal and resetting as simple as possible. Of the nine jointers we tested for this article, only two—the Ryobi JP-155 and Sears 23220—have blade-adjustment screws that allow you to set the knives at the height of the outfeed table by means of two screws alongside the knives as shown in photo *A*. With cutterheads that don't have adjustment screws, such as those on the Grizzly G1182 shown in photo *B*, adjusting the blades requires you to use a screwdriver or other instrument. No matter what machine you purchase, the knife-setting jig on page 31 will prove a big help.



In addition to four blade locking bolts for a secure hold, the Ryobi JP-155 cutterhead shown at *bottom* has two blade height-adjustment screws to ease blade changes. The Grizzly G1182, as shown at *top*, has only three blade-locking bolts and no height-adjustment screws.

The big and small of it: Sears 4" model 236221 and the Grizzly 8" model G1018. A 4" difference in blade length makes for a big difference in overall capacity.

SAFETY FEATURES: AN ABSOLUTE MUST

All of the machines we tested—with the exception of the Total Shop 915—had guards covering the cutterhead on both sides of the fence as shown on the Delta 37-280 on the following page. The Total Shop model we tested had no guard over the end of the cutterhead behind the fence, exposing up to 4 inches of spinning knives with the fence pulled toward the operator (see photo *below*). Wayne Preston of Total Shop says his firm now includes a guard that attaches to the backside of the fence. If you already own a Total Shop jointer that lacks this safety feature, you can purchase a guard from the company for $10.95 plus a minimum $3 shipping charge. You'll have to drill and tap three holes into the fence in order to mount the hinged plate.

We applaud the safety-conscious attitude of manufacturers that include push blocks with these machines: Delta 37-280, Ryobi JP-155, and Sears 23220.

Continued

The Total Shop 915's lack of a guard behind the fence scared us. Total Shop says they've recently added a guard.

JOINTERS

MOTORS: SPEED AND POWER COUNT

We jointed a variety of woods with ease on all of the test machines, and happily, none of them lacks power. But, the Ryobi JP-155 produced a far-smoother finish than any of the other machines. Why?

With jointers, the higher the number of cuts per minute (cpm) the smoother the surface of your workpiece should be. Thanks to its rapidly turning universal motor, this mighty tike of a jointer (it weighs only 27 pounds) produces up to 32,000 cpm. Of the induction-motor jointers, none produce more than 24,600 cpm.

To confirm our theory that more cuts equals a smoother surface, we surfaced a 5"-wide piece of highly quilted maple on all of the jointers we tested. All of the machines except the Ryobi produced considerable grain tear-out.

The trade-off? Universal motors don't last as long on average as induction motors and have brushes that need occasional replacement. For the home workshop, a universal motor-powered jointer shouldn't require excessive maintenance. However, universal motors are noisier.

OTHER POINTS TO CONSIDER

● **Stands:** With the exception of the Ryobi JP-155 shown *below,* and the 4" Sears jointer, each machine we tested came with a stand. All the stands were stable except for the Total Shop 915. Rubber pads on its base contributed to a 2–3" sway with just a slight push on the machine. Total Shop plans to introduce a new base at a future date. Among the other machines, we liked the Grizzly stands that have chip chutes to direct cutting debris away from the motor and motor pulley, and conveniently into a trash container.

● **Construction materials:** Nearly all the jointers on the market have plenty of cast iron in their construction, making for stable, but heavy machines as shown in the chart *opposite.* And remember, if you buy one of these machines through the mail you'll pay freight on every extra pound.

The Delta 37-280, shown at *left,* makes a slight departure from the cast-iron trend by using extruded aluminum, a light but stable material, in its fence. But once again, the Ryobi JP-155 separates itself from the crowd by setting cast-aluminum tables and a fence on a plastic base for lightness. Ryobi engineers thoughtfully covered the outfeed table with a smudge-free stainless-steel sheet for long wear.

▲ Only one jointer—the Ryobi JP-155—has a variable-speed control: a plus as far as we're concerned.

◀ Delta 37-280

6" JOINTERS: WHO HAS THE EDGE?

MANUFACTURER/IMPORTER	MODEL	BED LENGTH (in.)	CUTS PER MINUTE	MAX. CUTTING DEPTH (in.)	MOTOR			KNIFE HEIGHT ADJUSTMENT SCREWS (Y/N)[2]	FENCE				FENCE		ADJUSTMENTS			STANDARD EQUIPMENT[5]	JOINTER WARRANTY	MOTOR WARRANTY	U.S. SERVICE CENTERS	COUNTRY OF ORIGIN[6]	WEIGHT (lbs)	SUGGESTED PRICE	SELLING PRICE[7]
					TYPE[1]	AMPS	VOLTS		MATERIAL[3]	MATERIAL[3]	HEIGHT (in.)	LENGTH (in.)	DEPTH (Y/N)	OUTFEED TABLE LEVELING (Y/N)	INFEED TABLE LEVELING (Y/N)	TABLE ADJUST. CONTROL[4]									
AMT	4121	42	N/A	1/8	MOTOR NOT INCLUDED			Y	CI	CI	3 13/16	35½	Y	Y	Y	C	S	10 yrs	–	1	T	202	$459	$349
Delta	37-150	55½	16,500	½	I	14/7	115/230	Y	CI	CI	5	36	Y	Y	Y	L	S	2 yrs	2 yrs	152	B/U ***	265	1173	1000-1100
Delta	37-280	35½	12,900	⅜	I	14	115	N	EA	CI	3¾	24	N	Y	N	K	S, PB	2 yrs	2 yrs	152	T	143	440	370
Foley-Belsaw	445	45	14,490	½	I	12/6	110/220	N	CI	CI	4	28	Y	Y	Y	C	S	1 yr	90 days	1	T	197	650	425
General	1180-1	42½	12,600	½	I	12/6	115/230	N	CI	CI	4	35	Y	Y	Y	C	S	1 yr	2 yrs	6	C	226	800	750
Grizzly	G1182	47	15,000	½	I	13/6.5	110/220	N	CI	CI	4	29¼	Y	Y	Y	L	S	90 days	1 yr	2	T	260	335	335
Jet	JJ6	42½	13,500	½	I	12/6	115/230	N	CI	CI	4	28	Y	Y	Y	C	S	1 yr	90 days	530	T	194	456	360-410
Lobo	JT-0006	42½	13,500	½	I	18/9	115/230	N	CI	CI	4	28	Y	Y	Y	K	S	1 yr	1 yr	1	T	194	379	295
Powermatic	1500040	48	15,000	½	I	14	115	Y	CI	CI	4	34½	Y	Y	Y	L	S	1 yr	1 yr	425	U	290	1288	1100-1150
Ryobi	JP-155	28½-54½*	16,000-32,000**	3/32	U	10.5	120	Y	CA	CA/SS	2⅝	28	N	N	N	K	PB	1 yr	1 yr	165	J	27	618	330
Sears	23220	36	12,900	⅛	I	8	120	Y	CI	CI	3¼	33	N	N	Y	K	S, PB	1 yr	1 yr	900	U	173	370	370
Total Shop	915	45	24,600	½	I	8/4	110/220	N	CI	CI	4½	28	Y	Y	Y	C	S	1 yr	1 yr	1	T	170	499	299

* Bed length increases from 28½" to 54½" with the addition of two bed extensions. A set of extensions cost $49.50 list.
** Variable speed.
*** Jointer made in Brazil. Stand, motor and electricals assembled in USA.
1. (I) Induction; (U) Universal.
2. All models have 3 knives except the Ryobi JP-155 which has 2.
3. (CA) Cast aluminum; (CI) Cast iron; (EA) Extruded aluminum; (SS) Stainless steel.
4. (C) Crank; (K) Knob; (L) Lever.
5. (PB) Push blocks; (S) Stand.
6. (T) Taiwan; (B) Brazil; (U) USA; (J) Japan; (C) Canada.
7. Approximate selling price based on advertisements, catalogs, and dealer inquiries at time of article's writing.

MANUFACTURERS LISTING:

American Machine & Tool Co. (AMT)
215/948-0400

Delta International Machinery Corp.
Outside Pa.: 800-438-2486
Pa. residents: 800-438-2487

Foley-Belsaw
Outside Mo.: 800-468-4449
Mo. residents: 800-892-8789

General Mfg. Co. Ltd.
819/472-1161

Grizzly Imports
206/647-0801

Jet Equipment & Tools
Outside Wash.: 800-426-8402
Wash. residents: 206/572-5000

Lobo Power Tools
818/350-1096

Powermatic
Outside Tenn.: 800-248-0144
Tenn. residents: 615/473-5551

Ryobi America Corp.
312/250-7999

Sears
Call or visit your local Sears store

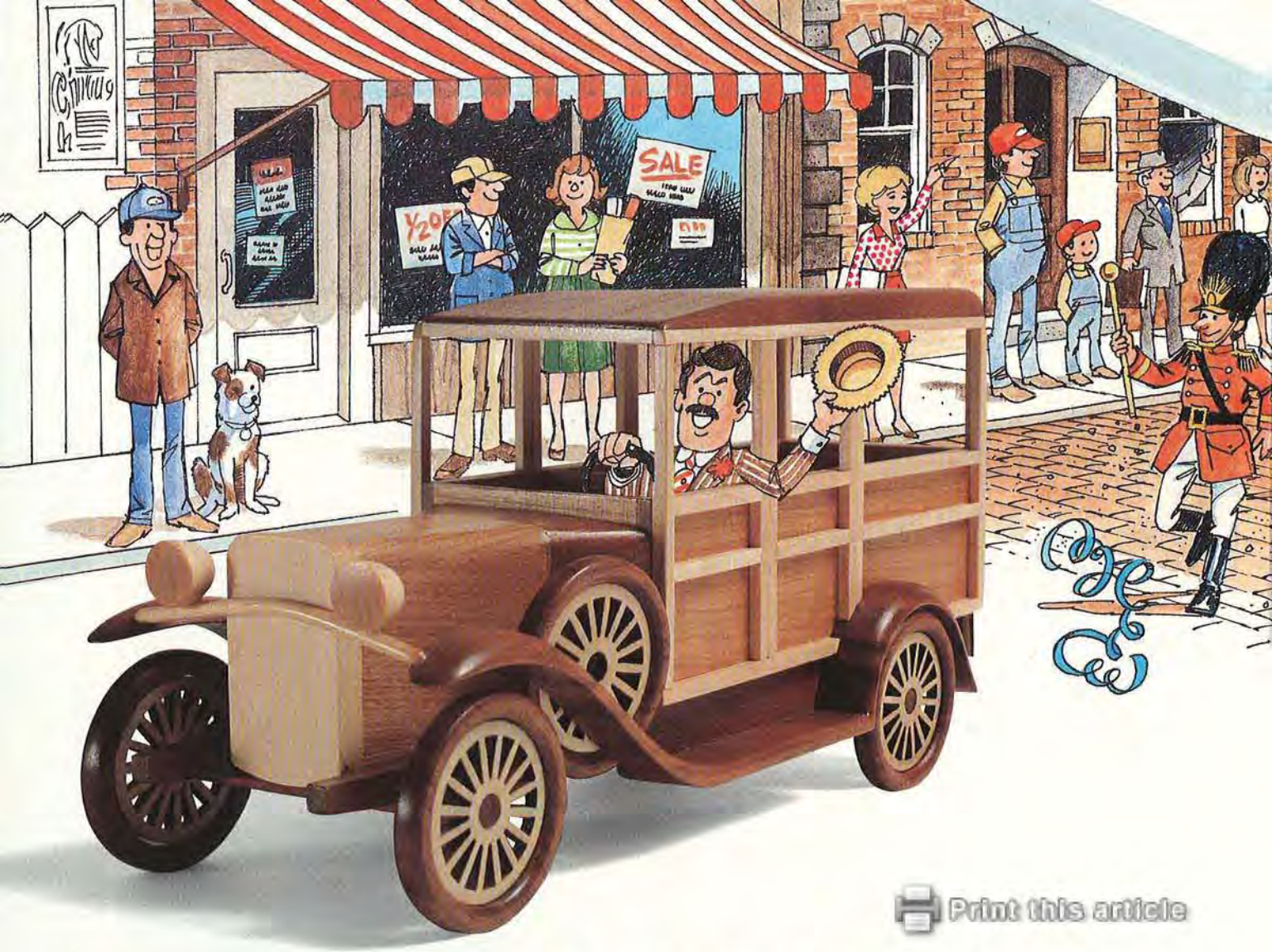
Total Shop
Outside S.C.: 800-845-9356
S.C. residents: 803/288-4174

OUR RECOMMENDATION

With its JP-155 jointer, Ryobi has basically taken its 6⅛" model L-580A hand-held planer, turned it upside down, and added variable speed. The formula works. Although we initially wondered about the wisdom of such a departure from typical jointer construction, this machine's ability to produce a smooth finish on dense and highly figured woods changed our minds. And, the machine's smooth cut produced an extra benefit: increased safety. As Jim Downing, WOOD magazine's design editor puts it: "I like the Ryobi's manners—it doesn't hammer the wood or want to throw the wood back at you."

About the only things we can fault in this machine are the short height of its fence (2⅝") and the length of its bed (only 28½"). Ryobi markets bed extensions that increase the bed length to 54½" but we weren't able to obtain a set to test for trueness. Because of its lightweight construction and universal motor, this unit wouldn't fare well in a heavy-use or user-abusive environment.

Written by Bill Krier
Technical consultant: Dennis Puckett
Illustration: Jim Downing; Jim Stevenson
Photographs: Jim Kascoutas



Print this article

FIFTH-ANNIVERSARY SPECIAL

THE CLASSIC WOODY

Help us celebrate WOOD® magazine's fifth anniversary in grand fashion by building our classic Woody. Once you've crafted this collector's item—reminiscent of a 1930 Ford Woody—send us a photo of the completed model, and we'll send you, free of charge, a ½×1" engraved brass license plate, like the one offered on page 76. We've numbered them sequentially, so get started right away and receive a low number.

Note: You'll need thin stock for this project. You can either plane or resaw stock to the thickness stated in the Bill of Materials. Or, see the Buying Guide on page 77 for our source. You'll find helpful suggestions in our "Working Small" article, starting on page 50, when working with the small car parts.

THE WHEELS START THE ASSEMBLY LINE ROLLING

Note: We found it best to build the wheels and add them to the chassis now for ease in positioning the fenders on the chassis in the next section. See the Buying Guide for our source of laser-cut spoked rims.

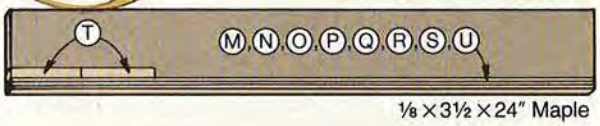
1 Cut a piece of ¼"-thick walnut to 2½" wide by 15" long (enough material for six tires—an extra tire in case one breaks during machining). Now, cut a piece of ½" or ¾" scrap stock to the same length and width as the walnut.

2 Cover the bottom side of the walnut with double-faced tape, and stick the walnut to the scrap block with the edges and ends flush. Mark reference lines on the walnut for locating the wheel centerpoints where dimensioned on Step 1 of the drawing titled Cutting The Tires on the opposite page.

3 Mount a circle cutter in your drill press, and follow the two-step

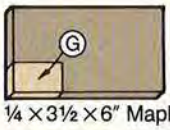
5th Anniversary Celebration

¾ × 3½ × 12" Cherry

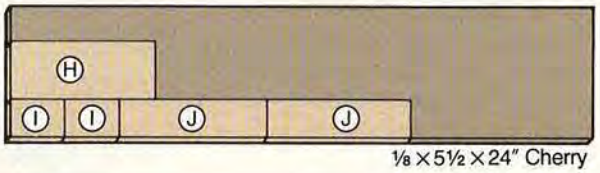


⅛ × 3½ × 24" Maple

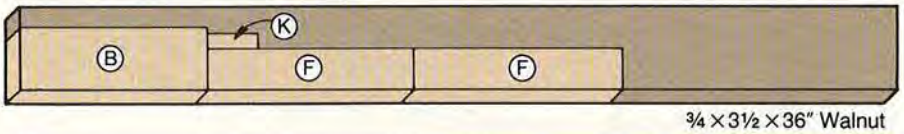
Cutting Diagram



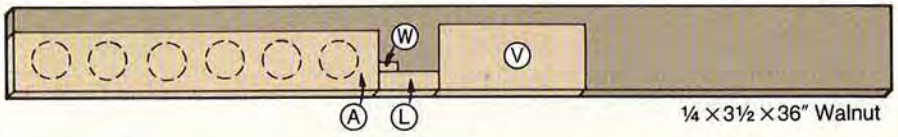
¼ × 3½ × 6" Maple



⅛ × 5½ × 24" Cherry

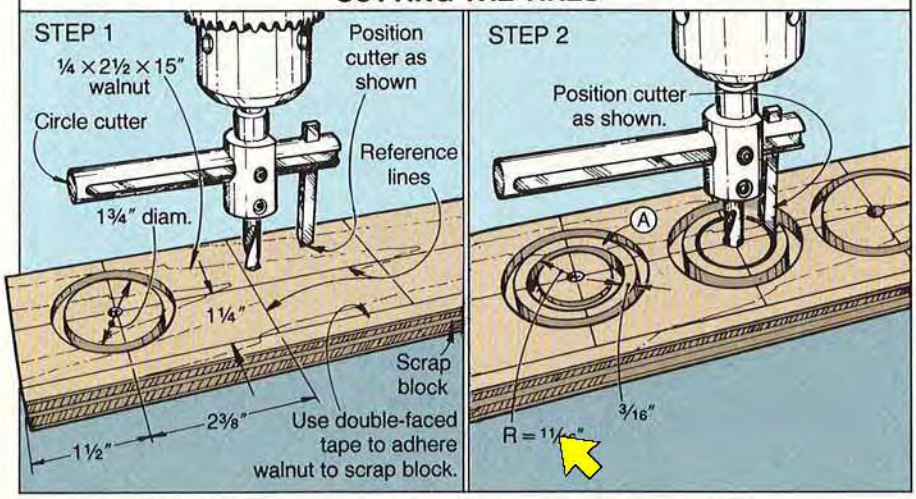


¾ × 3½ × 36" Walnut



¼ × 3½ × 36" Walnut

CUTTING THE TIRES



Bill of Materials

Part		Finished Size*			Matl.	Qty.
		T	W	L		
A	tires	¼"	1¾" diameter		W	5
B	chassis	½"	2½"	7¾"	W	1
C*	side panels	1½"	1¼"	2"	LC	1
D*	hood	¼"	1½"	2"	C	1
E	cowl	¾"	1½"	2½"	C	1
F*	fenders	¾"	1¾"	8½"	W	2
G	radiator	¼"	1⅛"	1¾"	M	1
H	floor	⅛"	2½"	6"	C	1
I	firewall, tailgate	⅛"	1½"	2¼"	C	2
J	side panels	⅛"	1½"	6"	C	2
K	seat	½"	¾"	2¼"	W	1
L	seat back	¼"	1½"	2¼"	W	1
M	trim	⅛"	⅛"	7⅞"	M	2
N	trim	⅛"	⅛"	1¼"	M	2
O	window posts	⅛"	⅛"	2¾"	M	12
P	trim	⅛"	⅛"	6"	M	2
Q	trim	⅛"	⅛"	2½"	M	4
R	trim	⅛"	⅛"	1⅜"	M	8
S	trim	⅛"	⅛"	2½"	M	1
T	trim	⅛"	¼"	3"	M	2
U	trim	⅛"	⅛"	2¼"	M	4
V	roof	¼"	2¾"	6⅛"	W	1
W	license block	¼"	¼"	¾"	W	1

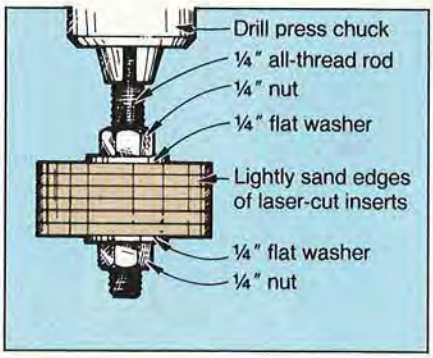
*Initially cut * parts oversized. Trim them to finished size according to the how-to instructions.
Material Key: W-walnut, LC-laminated cherry, C-cherry, M-maple
Supplies: double-faced tape, ¼" walnut dowel stock for axles, ⅛" birch dowel stock for light bar, ½" birch dowel stock for headlights, masking tape, finish.

Continued

drawing to cut the walnut tires to shape. Note the position of the cutter in each step.

4 To avoid breaking the tires when removing them from the scrap block, splash a little lacquer thinner over each tire to weaken the tape adhesive. Then, carefully pry the tires from the tape. Hand-sand a slight round-over on the inside and outside edges of each tire.

5 To smooth the outside edges of the rims—they're a little rough from the laser cutting—fasten them to a 6" length of ¼" all-thread rod. Chuck the assembly into your drill press as shown in the drawing *below*. Using a sanding block, *lightly* sand the outside edges smooth; be careful not to sand too much. Remove the rims from the rod.



6 To adhere the rims to the tires, position one of the tires on a flat surface. Place a ¼" washer inside the tire, and lay a rim on the washer. Apply a few drops of instant glue to adhere the tire to the rim as shown in the photo at top of the next column. (We used a pencil to center the rim inside the wheel when gluing.) Repeat for each wheel. (We found instant glue helpful to avoid problems adhering the small parts.) See the Buying Guide for our source of glue.

7 Cut the front and rear axles to 3⅛" long from ¼" walnut dowel stock. Glue the axles to the rims, with the ends of the axles flush with the *outside face* of each rim.

CONSTRUCT THE CHASSIS

1 Cut a piece of ½"-thick walnut (we planed ¾" stock) to 2½×7¾" long for the chassis (B).

Dab instant glue onto the joint between the tire and the laser-cut insert.

2 Mark the location, and dado on the bottom of the chassis, using the dimensions on the Chassis Side-View Drawing for reference.

3 Using the Side View for reference, mark the cutline for the taper along one edge at the front of the chassis blank. Bandsaw the taper.

4 Now, referring to the Top View Drawing, mark the shape of the chassis on the top surface of the walnut and cut the chassis to shape. Sand the chassis smooth.

5 Turn the chassis upside down. Center the axle assemblies from side to side on the chassis, and glue them into the dadoes.

NEXT, THE HOOD ASSEMBLY

1 To form the engine side-panel lamination (C), cut two pieces of ¾" cherry stock to 1¼×4". With the edges and ends flush, glue and clamp together the two pieces.

2 Cut the hood (D) to the size listed in the Bill of Materials plus 2" in length. Glue and clamp the hood to the engine side-panel lamination, with the edges and ends flush where shown on the drawing *below*. After the glue dries, trim both ends for a 2" finished length.

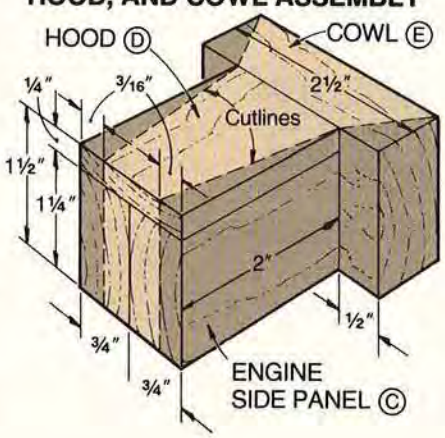
3 Cut the cowl (E) to size and glue it to the lamination where shown on the drawing *below*.

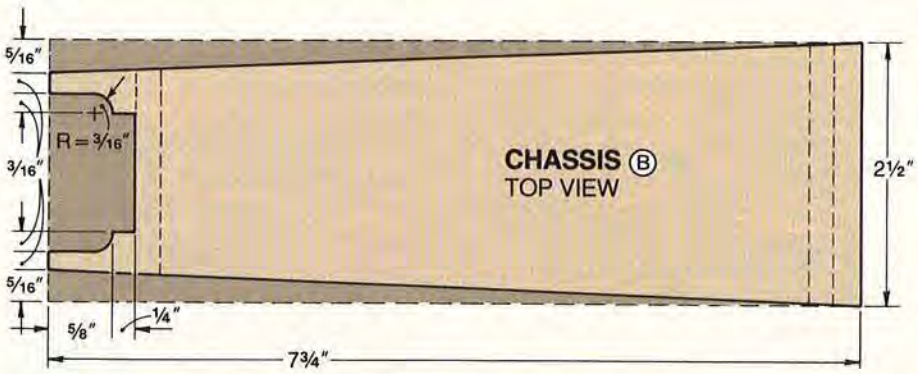
4 Mark the cutlines where shown on the drawing *below*, and bandsaw the sides of the assembly where marked. Sand smooth.

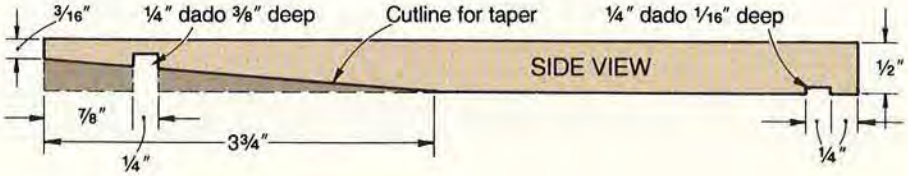
5 Rout or sand a ¼" round-over along the top edges of the hood assembly where shown on the drawing on page 77.

6 With the front of the hood assembly flush with the notch in the chassis, glue the hood assembly to the chassis. Center the assembly from side to side on the chassis.

MAKING THE SIDE PANELS, HOOD, AND COWL ASSEMBLY







ON DOWN THE LINE, FORM THE FENDERS

1 Cut two pieces of ¾" walnut to 1¾×8½" long for the fenders (F).

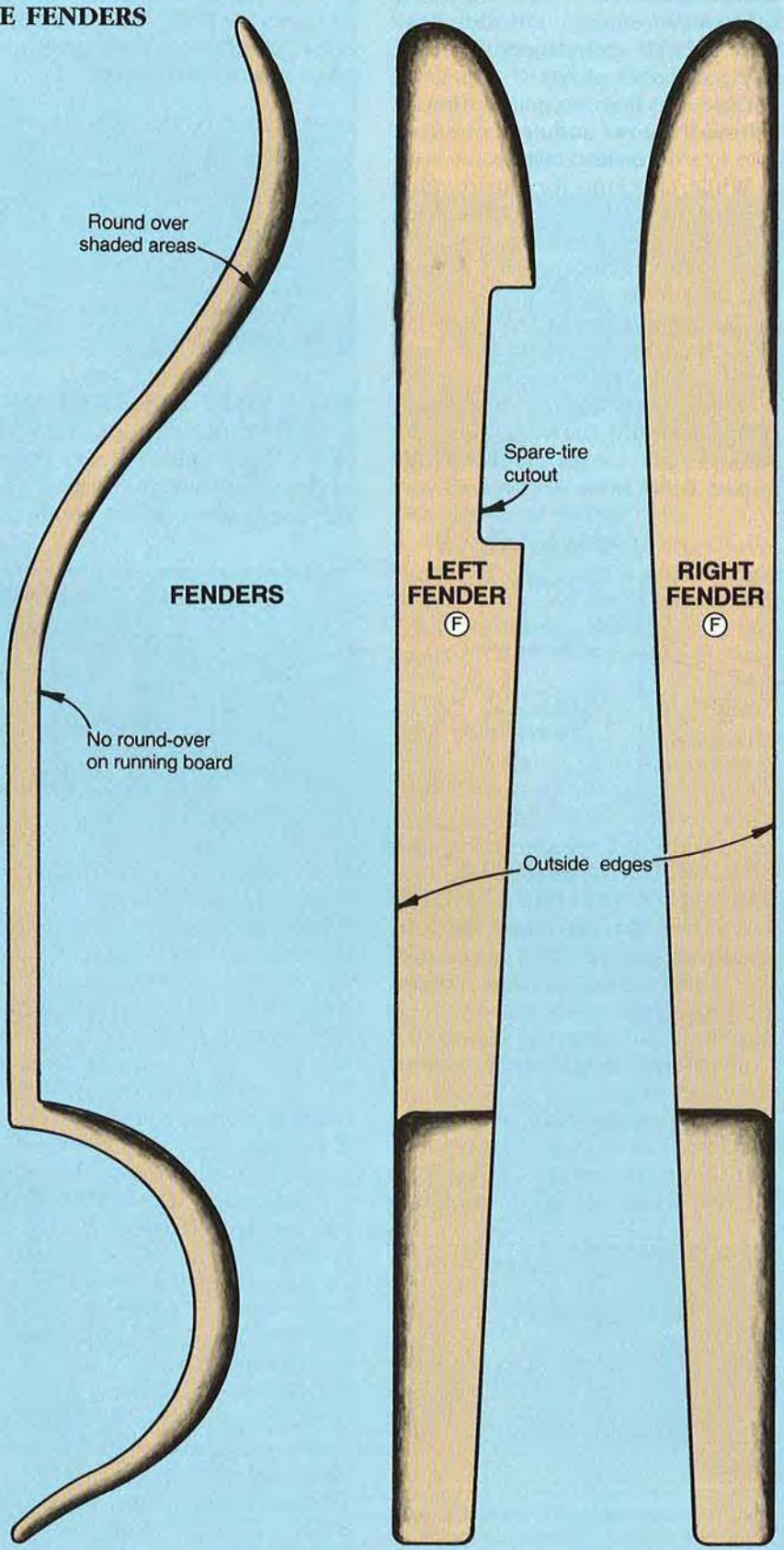
2 Transfer a full-sized side-view fender pattern to the *outside face* of each fender blank with carbon paper or by adhering a photocopy of the pattern to the stock. Transfer the right fender top view to one blank and the left fender top view to the other.

3 Bandsaw (we used a ⅛" blade) along the cutlines on the outside face of each fender. Then, tape the pieces together and cut along the marked top-view cutlines to finish cutting the fender to shape as shown in the photo *below*.

4 Carefully sand round-overs on each fender where shown on the Fenders Drawing at *right* and in the opening photo. (We used the drill-and-disc-sanding technique shown on page 53 to sand the fenders; you also could hand-sand them to shape.)

5 Position and tape the fenders to the chassis. Taping the fenders in place frees your hands to apply the glue. When locating the fenders, keep an even gap between the rear wheel and fender, and hold the bottom of the front fender 3/16" above the top of the tire. When properly taped in position, glue in place. Later, remove the tape.

We adhered a photocopy of the pattern to the fender blank with spray-on adhesive, and then cut the fender to shape.



Continued

THE CLASSIC WOODY

BODY BY YOU

1 From ⅛" cherry, cut the floor (H), firewall and tailgate (I), and side panels (J) to size.

2 Glue the floor in place directly behind the cowl and centered from side to side on the chassis.

3 While checking for square, glue the firewall to the back of the hood assembly and to the top of the floor. Now, glue the side panels and tailgate in place.

4 Cut the seat pieces (L, K) to the sizes listed in the Bill of Materials. Sand a ⅛" round-over on each where shown on the Hood and Body Assembly Drawing. Glue the pieces in place with the front edge of part K ⅝" from the firewall.

5 With the back edge of the spare tire even with the back edge of the cowl, glue the spare tire and rim in place against the chassis.

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***WOOD* Magazine**
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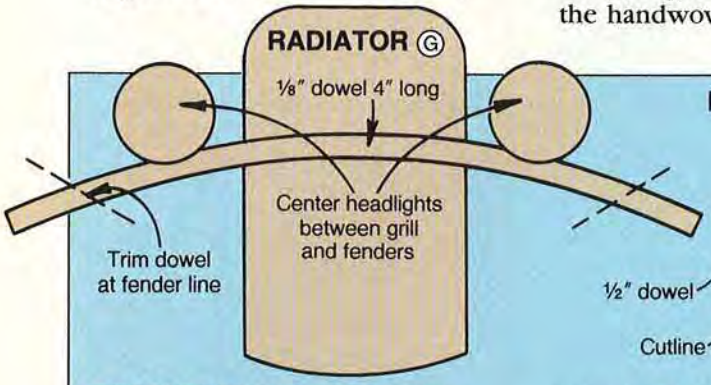
LET'S VISIT THE TRIM SHOP

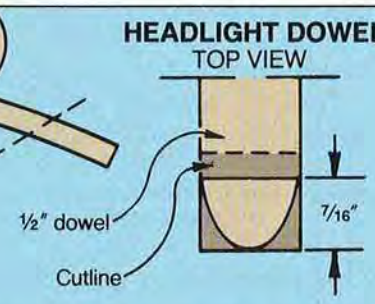
1 From ⅛" maple stock, rip 3 strips ⅛×⅛×24" long. See our method of ripping thin strips on page 79 of the handwoven basket article.

2 Cut bottom trim pieces (M, N) to length plus ¼" from the 24"-long pieces. Sand one end of trim pieces M and N to conform to the fender. Glue trim pieces M and N in place.

3 Cut the maple window posts (O) to length. Mark centerlines on the outside face of the cherry side panels (J) where dimensioned on the Hood and Body Assembly Drawing at *right*. Glue the posts in position as shown in the photo on the opposite page. Sand the ends of four window posts to conform to the fender. Carefully align the top ends of the posts.

4 Cut the remaining trim pieces (P,Q,R,S,T,U) to the lengths listed in the Bill of Materials. Glue the remaining trim pieces in place.





BRIGHT IDEAS FOR THE RADIATOR AND HEADLIGHTS

1 Transfer the full-sized radiator pattern to a piece of ¼" maple. Cut the radiator (G) to shape. Hand-sand the radiator smooth.

2 Center the radiator against the front of the hood assembly and glue it in place.

3 Using a straightedge, mark a line the length of a piece of plywood. Mark four centerpoints 1" apart on the line where shown in the photo *below left*. Drive a 6d nail at each of the four centerpoints.

Soak ⅛" dowel stock in water, and then bend the dowels around the nails to shape the headlight bars.

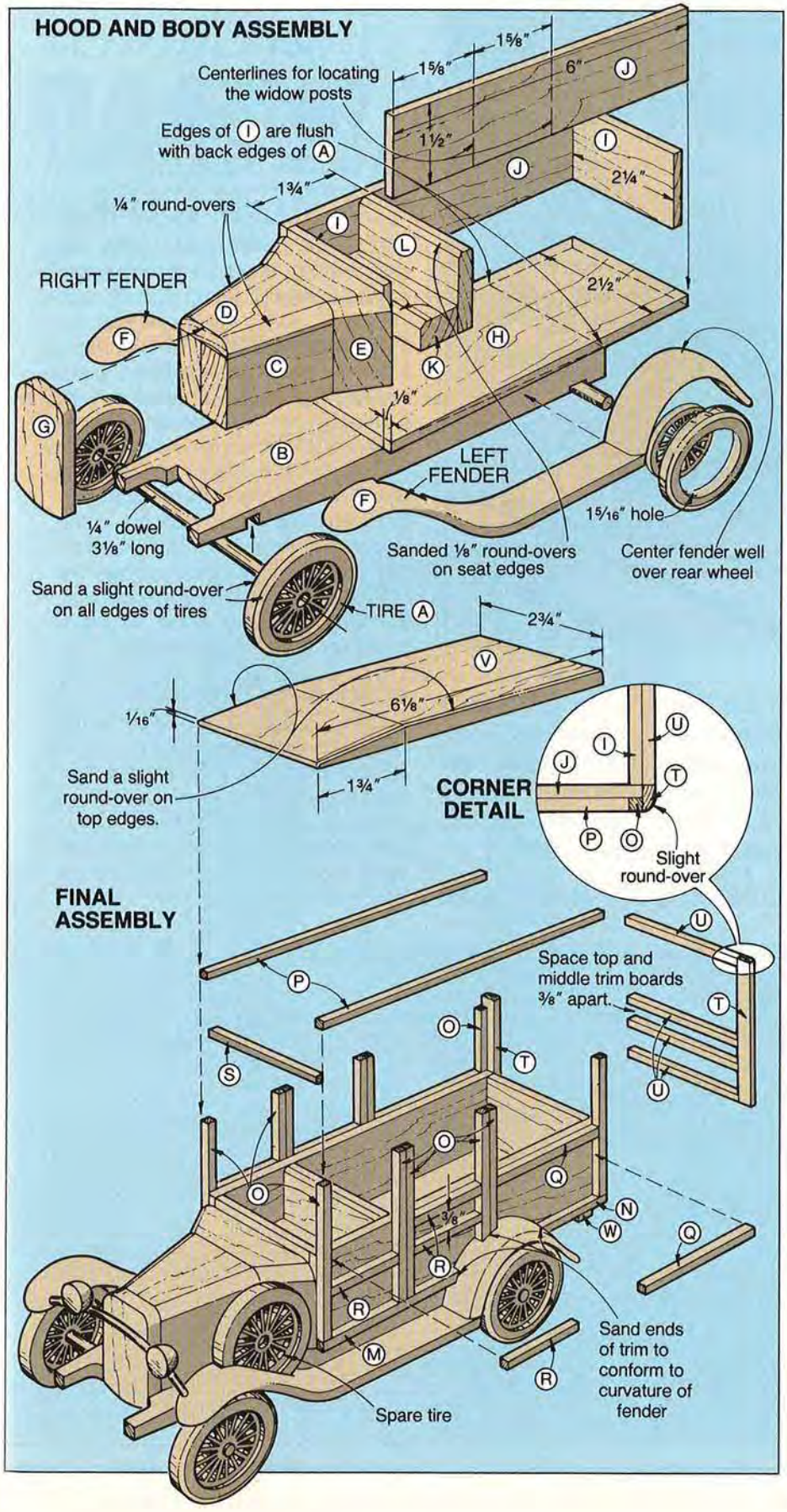
4 Cut three pieces of ⅛" dowel stock to 4" long for the headlight bar. Soak the three pieces of dowel in hot water for one hour. Remove the dowels from the water and weave them in position as shown in the photo. Let the dowels dry overnight in the form.

5 Remove the dowels from the form. Save the dowel that retains the most curve. Position that dowel on the full-sized Radiator and Headlight Drawing and mark the cutlines. Trim the headlight bar where marked. Check the fit of the bar between the front fenders and sand for a flush fit.

6 From ½" dowel stock, cut a piece 6" long. Chuck the dowel in your drill press. With the drill press running at about 500 rpm, hold a pencil against the spinning dowel and mark a line 7/16" from the bottom end of the dowel. As shown in the photo *above*, shape a headlight at the end of the dowel with a sanding block. See the Radiator and Headlight Drawing *above left* for reference. Remove the dowel from the drill press and trim the headlight where marked. Repeat the process to form a second headlight.

Chuck a ½" dowel into your drill press and sand the bottom end to form a headlight.

7 Glue the headlight bar in place between the fenders and against the radiator. Glue the headlights to the bar where shown on the Radiator and Headlight Drawing.


HOOD AND BODY ASSEMBLY
Centerlines for locating the widow posts
Edges of (I) are flush with back edges of (A)
¼" round-overs
RIGHT FENDER
LEFT FENDER
¼" dowel 3⅛" long
Sanded ⅛" round-overs on seat edges
1⅝" hole
Center fender well over rear wheel
Sand a slight round-over on all edges of tires
TIRE (A)
Sand a slight round-over on top edges.
CORNER DETAIL
Slight round-over
FINAL ASSEMBLY
Space top and middle trim boards ⅜" apart.
Sand ends of trim to conform to curvature of fender
Spare tire

5 Cut the roof (V) to size and belt-sand a taper on the front top edge where dimensioned on the Final Assembly Drawing. Sand a slight round-over on the top edges of the roof where shown on the drawing. Glue the roof in place.

Position and glue one window post on each side of the marked lines.

6 Hand-sand a slight round-over along the back edges of the body where shown on the Corner Detail.

7 Cut the license block (W) to size and glue it to the floor.

PAINT IT, LICENSE IT, AND HIT THE ROAD

Apply the finish. Send us a photo of your Woody for a free, brass license plate (see the offer on the opposite page for details). Glue the license plate to the license block.

BUYING GUIDE

- **Instant glue kit (cyanoacrylate).** Hot Shot Special "T", bonds in 50 seconds, 2-oz. bottle. Solvent, 2-oz. bottle separates objects mistakenly bonded. One bottle of each for $16.65 ppd. Garrett Wade, 161 Ave. of the Americas, New York, NY 10013 or call 800-221-2942.

- **Spoked inserts.** Six laser-cut baltic birch inserts, 1⅝" diameter, $5.45 ppd. Custom Awards, 1427 NW. 81 St., Des Moines, IA 50311.

- **Hardwood.** Same-sized pieces and types of wood shown in the Cutting Diagram. $19.75 ppd. ($24.75 in Canada). EDLCO, P.O. Box 5373, Asheville, NC 28813, or call 704/255-8765 to order.

Produced by Marlen Kemmet
Project Design: James R. Downing
Photographs: Hopkins Associates
Illustrations: Kim Downing; Bill Zaun
Opening illustration by Jim Stevenson

Handwoven WHAT A TOP DESIGN

My travels around the country to the nation's top crafts fairs bring me in contact with many beautiful woodworking projects. But on a recent trek to Minnesota, I did a double-take when I happened onto this hardwood basket from designer/woodworker Keith Raivo. It's easy to make, thanks to Keith's method of cutting the weavers with a tablesaw.

Print this article

Marlen Kemmet **How-To Editor**

NOTE: You'll need thin stock for this project. You can either resaw or plane thicker stock to size.

PREPARING THE STOCK;

1 For the base (A), uprights (B, C), bottom oak band (D), narrow walnut weavers (E), wide walnut weavers (F), center oak weaver (G), top oak bands (H, I), and lid pieces (J, K), rip and crosscut ¾"-thick, straight-grained boards to the size shown on the Cutting Diagram. The pieces are cut large initially for safety when machining them later.

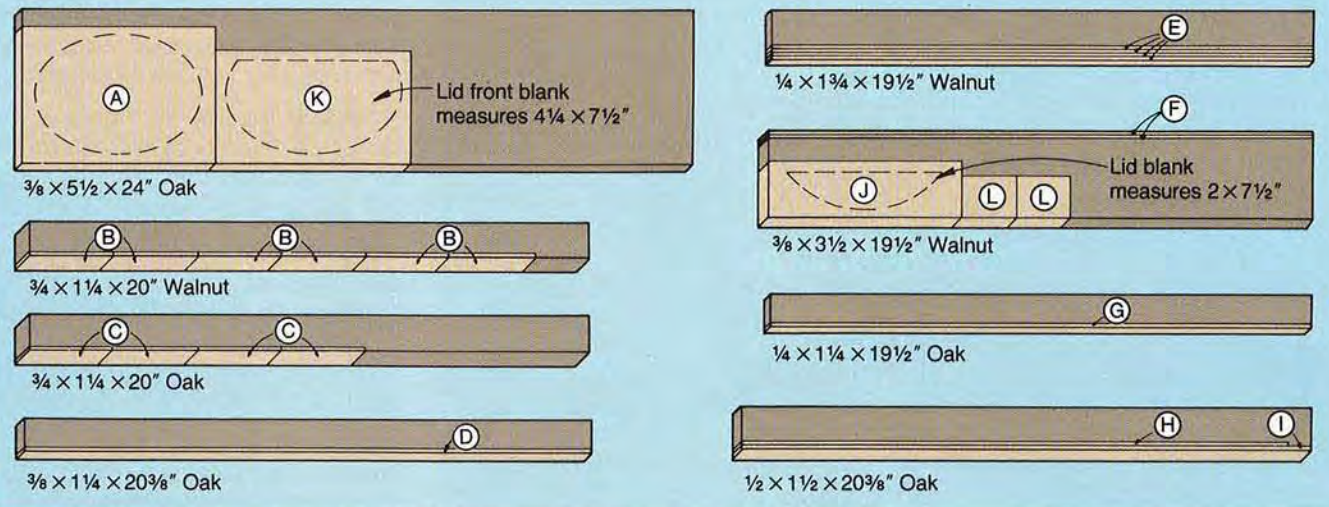
2 Plane the pieces to the thickness listed on the Cutting Diagram.

START WITH THE BASE

1 Using carbon paper or a photocopy and spray-on adhesive, transfer the full-sized Base Pattern and the 10 upright locations to the bottom side of the base blank (A).

2 Bandsaw the blank to shape and sand the cut edge smooth. Set the base aside for now.

Cutting Diagram



NOT BASKET

FROM THE UPTOWN ARTS FAIR IN MINNEAPOLIS

RIP THE THIN STRIPS WITH EASE AND SAFETY

Note: *We cut twice as many bands and weavers (D,E,F,G,H,I) as needed; it's easy to break the thin strips during construction.*

1 Stick a piece of masking tape to the tablesaw top where shown on the Strip Ripping Drawing. Position a straightedge against both sides of the saw blade and mark blade-reference lines on the masking tape. Now, mark a line parallel to the outside reference line 1/16" away from the blade where shown on the drawing. (To prevent the thin strips from falling into the saw, we cut a piece of hardboard to the same shape and thickness as the tablesaw insert. With the hardboard insert taped in place, we slowly raised the rotating blade through the hardboard to make a zero-clearance insert.)

2 Position the outside edge of the 20"-long walnut upright blank (B) along the 1/16" reference line. Using a push stick, rip a strip from the edge of the walnut. Measure the width of the strip and re-mark the line if the strip doesn't measure 1/16" (it took us a couple of tries).

3 Crosscut six uprights (B) to 3" long from the 1/16 × 3/4 × 20" strip.

4 Repeat the procedure to cut the oak uprights (C), the bottom oak band (D), and the top bands (H, I) to size. Trim the top inside band (I) to length (it's slightly shorter than the top outside band (H).

5 Remove the masking tape, mark a second line 1/32" from the outside blade-reference line, follow the procedure just described to cut 1/32"-thick weavers (E, F, G).

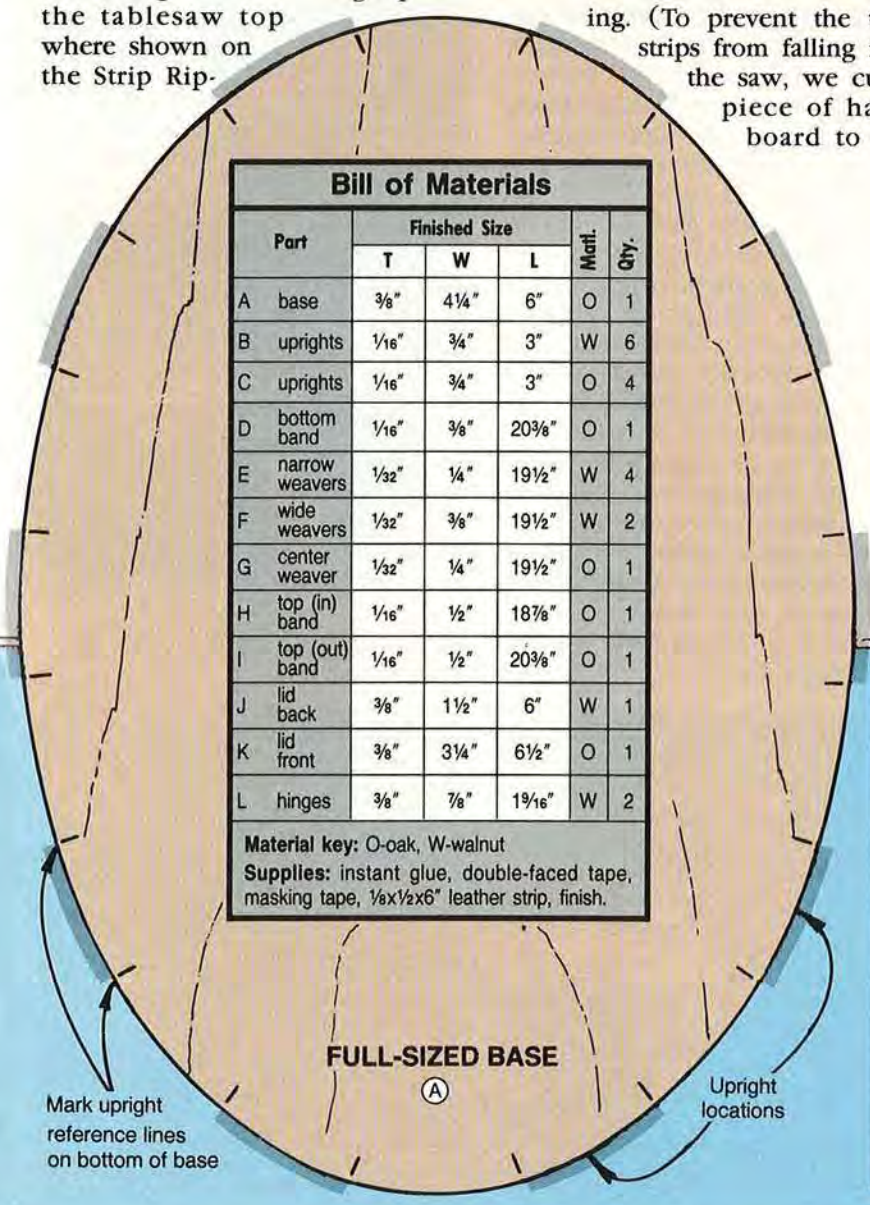
Continued

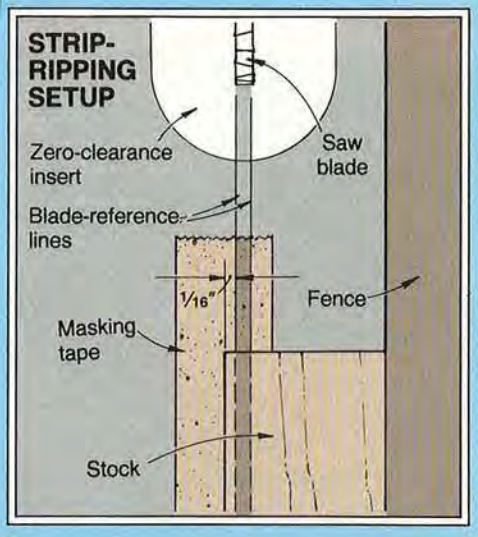
Bill of Materials

	Part	Finished Size T	W	L	Matl.	Qty.
A	base	3/8"	4 1/4"	6"	O	1
B	uprights	1/16"	3/4"	3"	W	6
C	uprights	1/16"	3/4"	3"	O	4
D	bottom band	1/16"	3/8"	20 3/8"	O	1
E	narrow weavers	1/32"	1/4"	19 1/2"	W	4
F	wide weavers	1/32"	3/8"	19 1/2"	W	2
G	center weaver	1/32"	1/4"	19 1/2"	O	1
H	top (in) band	1/16"	1/2"	18 7/8"	O	1
I	top (out) band	1/16"	1/2"	20 3/8"	O	1
J	lid back	3/8"	1 1/2"	6"	W	1
K	lid front	3/8"	3 1/4"	6 1/2"	O	1
L	hinges	3/8"	7/8"	1 9/16"	W	2

Material key: O-oak, W-walnut

Supplies: instant glue, double-faced tape, masking tape, 1/8x1/2x6" leather strip, finish.





WHATNOT BASKET

ATTACH THE UPRIGHTS AND START WEAVING

1 Using instant glue or epoxy, secure the oak and walnut uprights (B, C) to the oak base where previously marked. (See our source for instant glue in the Buying Guide on page 81.) After you have glued all the uprights in place, sand the bottom of the base to remove the upright-location pencil marks.

2 Belt-sand a taper on both ends of the bottom band (D) and the top bands (H, I). See the Bottom-Band Detail *below* for reference.

3 To make the strips (D,E,F,G,H,I) easier to bend, soak them overnight in water. (We had to weight ours down to keep them from floating to the surface of the cake pan).

4 Drill pilot holes, and glue and nail the bottom oak band (D) to the basket base. (See the Buying Guide on the opposite page for our source of copper clench nails.)

5 As shown in photo A, weave the bottom walnut weaver (E) through the uprights. (We wove the weaver at the top of the uprights. Once we completed the loop, we slid the weaver down next to the base.) Repeat the process until all but the top two bands (H, I) have been woven into place.

6 Loop the inside oak band (H) into position. Center the outside top band (I) over the *front* walnut upright (B). Clamp the band in place as shown in photo B. Drill a 1/16" hole through the top bands and upright as shown in the photo.

7 Fit a nail through the hole. Snip the pointed end of the nail with wire cutters so only 1/16" protrudes on the inside of the basket. Using a ball-peen hammer, rivet (flatten) the nails as shown in photo C. Repeat the drilling and nailing at each upright, overlapping the bands as shown on the Fastening Detail *below*. Let the box dry overnight.

TO TOP THINGS OFF, ADD THE LID

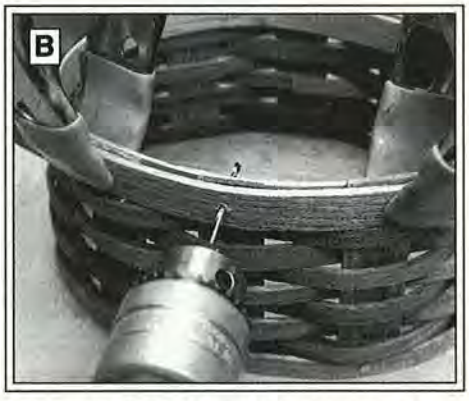
1 Tape the lid back blank (J) to the lid front blank (K) with the surfaces and ends flush. (We used double-faced tape.)

2 Turn the basket upside down, and place it on the taped-together lid pieces so the basket covers 1½" of the walnut lid back.

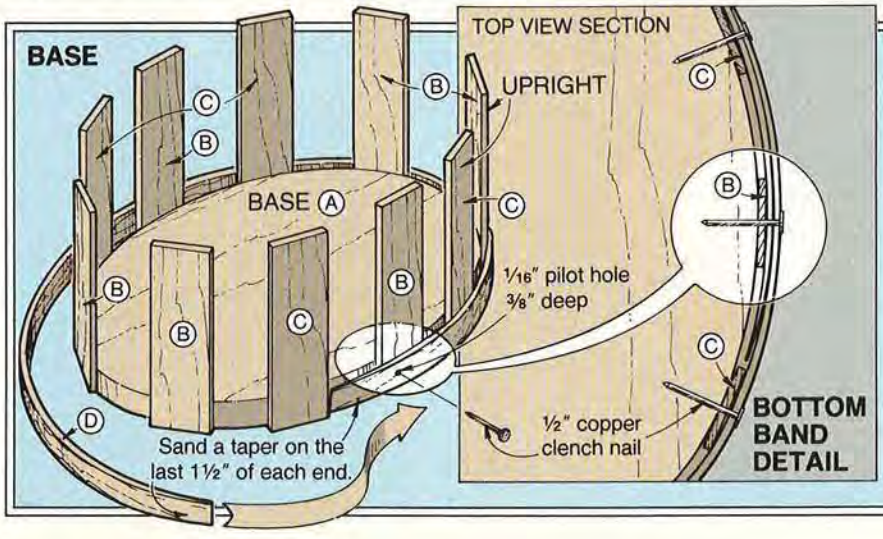
3 Tape the woven basket to the lid pieces as shown in photo D. With the lead of a sharp pencil in the hole of a 3/16" washer, trace around the basket to lay out the shape of the lid as shown in the photo. Cut the lid to shape, and sand the cut edges smooth.

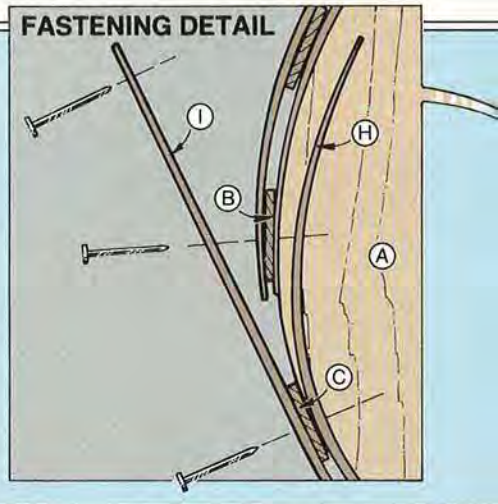
4 Chuck a 3/8" round-over bit in your table-mounted router. Rout a partial round-over on the top edge of the taped-together lid pieces where shown on the Hinge/Round-Over Detail. Sand smooth, and remove the tape holding the lid pieces together.

Weave the weaver into position at the top of the uprights. Then, slide the weaver against the base.



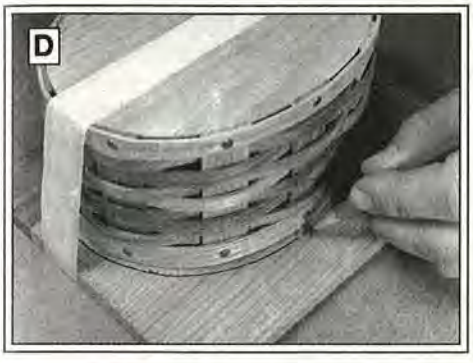
Drill a 1/16" hole through the top outside band, center walnut upright, and top inside oak band.





Produced by Marlen Kemmet

Use a ball-peen hammer and the top of your vise or an anvil to rivet the nail on the inside of the basket.



Using a washer to ensure an even overhang, transfer the lid outline onto the taped-together lid pieces.

FORMING THE HINGES AND ATTACHING THE LID

1 Using the full-sized Hinge Pattern *below right,* lay out two hinges, including the opening and the nail hole centerpoint, on ⅜" walnut stock. Cut the hinges to size. Drill a blade start hole and use a scrollsaw or a coping saw to cut the opening in each hinge to shape.

2 Sand a slight round-over on all top edges of each hinge.

3 Mark the hinge slot locations on the lid back (J) where dimensioned on the Lid Back Drawing *below.* Drill start holes and cut the openings to shape. Sand a slight chamfer on the front and back edges of each opening for a better fit later of the hinge straps. (For reference, see the Hinge/Round-Over Detail accompanying the drawing titled Attaching the Lid.)

4 From ⅛"-thick by ½"-wide leather, cut two strips 3" long each. Loop the leather through the hole in each hinge. (We bought our leather at Tandy—you also could get it at a shoe repair store.) With the ends flush, glue together the ends of the leather strips. (We used instant glue and left just enough free play for the hinge to rotate snugly in the leather loop.

5 Wrap a leather strap around a hinge, slip a strap through each slot in the lid back. Drill a 1/16" hole through each leather strap where shown on the Hinge/Round-Over Detail. Push a nail through each hole in the leather, and then bend it over as shown on the detail.

6 Hold the lid front (K) 1/16" away from the lid back, and mark the hinge locations on the lid front. Glue and clamp the hinges to the lid front where marked. Later, remove the clamps, and drill a 1/16" hole through each hinge and lid. Drive a copper clench nail through each hole—these two nails are for appearance only.

FINAL ASSEMBLY AND PRESTO, IT'S DONE!

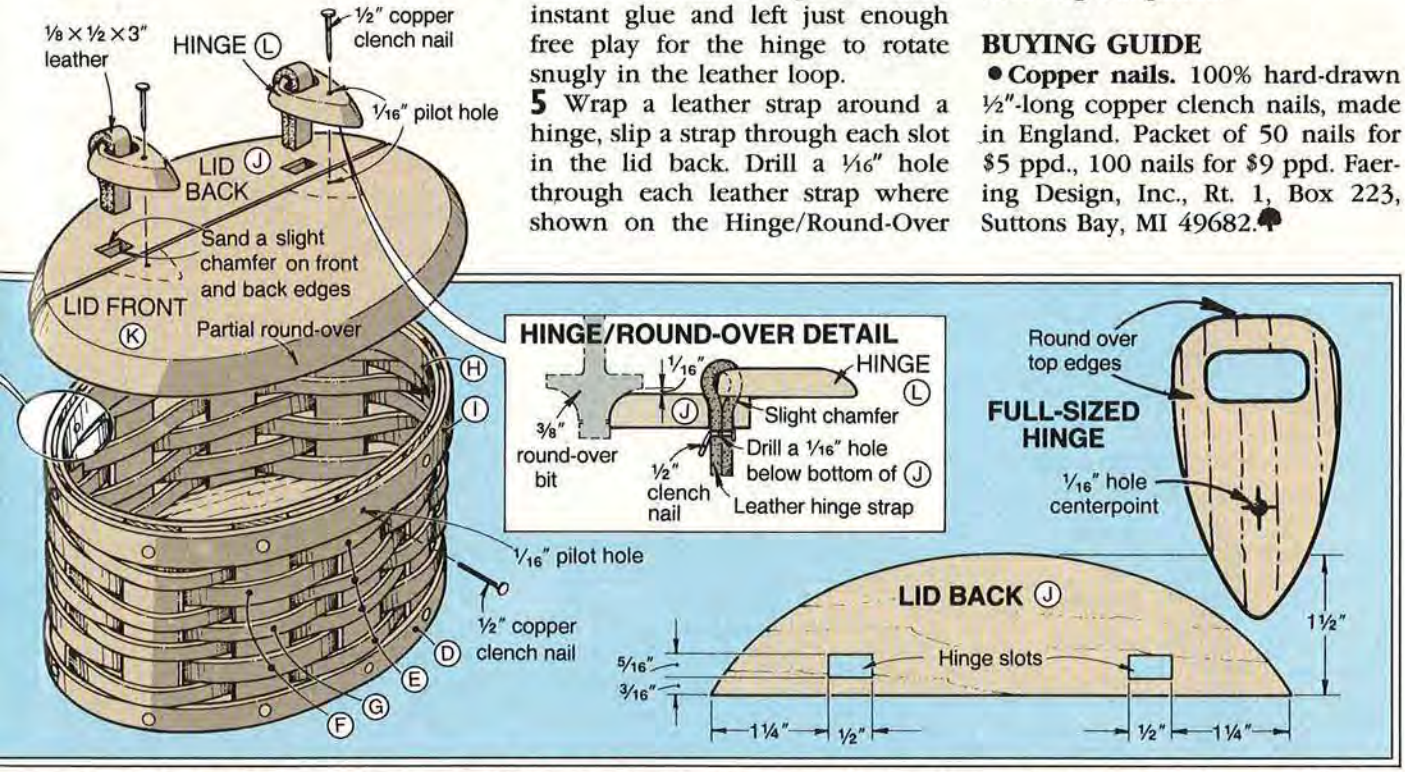
1 Carefully belt-sand the top of the uprights flush with the top oak bands. Then, hand-sand the entire basket with 220-grit sandpaper. (Soaking the wood causes lots of raised grain.)

2 Glue and clamp the lid back (J) to the basket with an even overhang around the back edge. Immediately wipe off excess glue with a damp cloth.

3 Apply a clear finish. (We used an oil finish; an aerosol also would work well to help cover all those hard-to-get-at places.

BUYING GUIDE

• **Copper nails.** 100% hard-drawn ½"-long copper clench nails, made in England. Packet of 50 nails for $5 ppd., 100 nails for $9 ppd. Faering Design, Inc., Rt. 1, Box 223, Suttons Bay, MI 49682.



Project Design: Keith Raivo Designs, Brook Park, MN 55007. Photographs: Hopkins Assoc. Illustrations: Kim Downing; Bill Zaun

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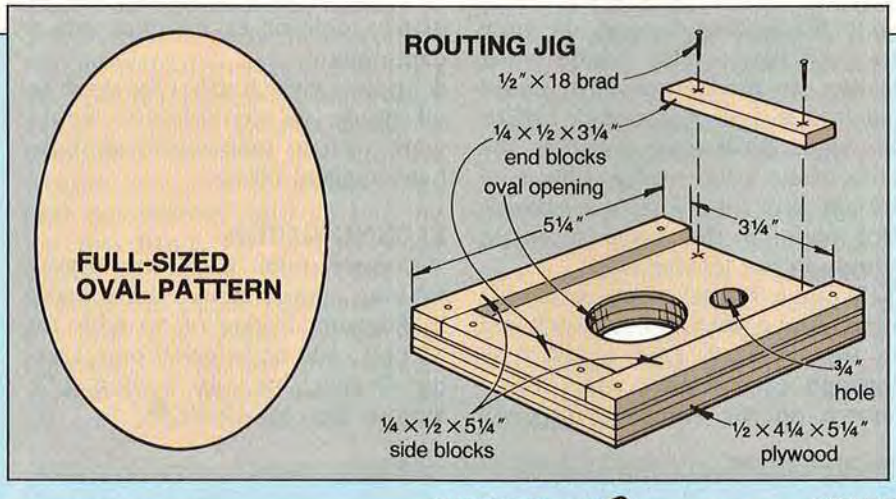
PINT-SIZED A TERRIFIC WAY

Note: *You'll need 7/16" and 3/16" stock for this project. You can either plane or resaw thicker lumber to this thickness. You might also want to read the "Working Small" article on page 50. It provides helpful suggestions for machining small-parts projects such as this.*

START WITH THE ROUTING JIG

Note: *The jig allows you to mass-produce these frames easily.*

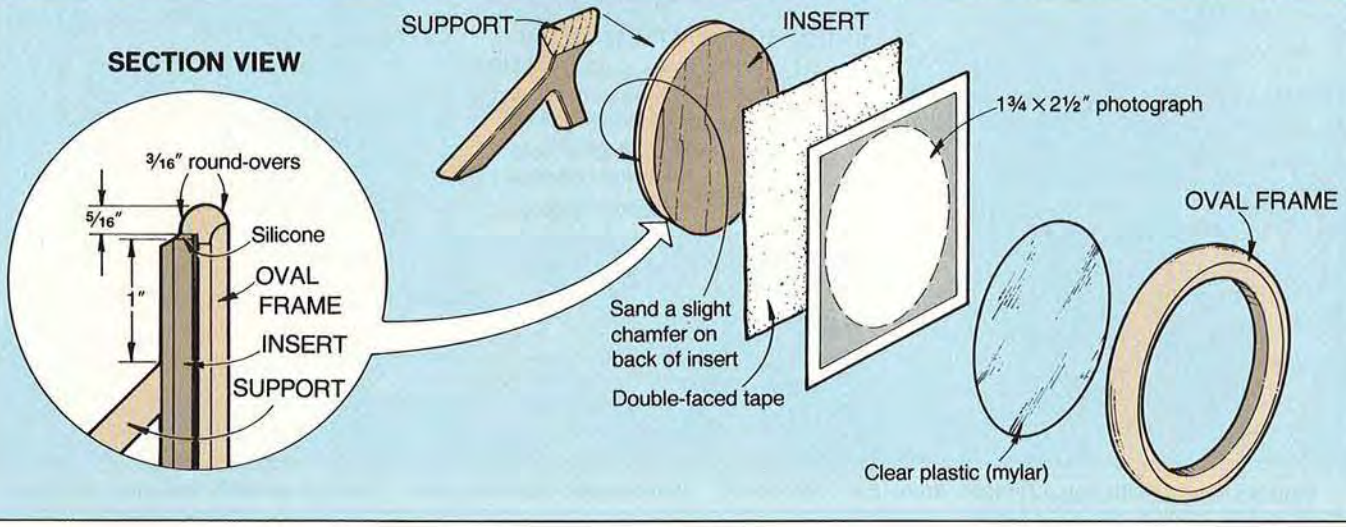
Cut a piece of ½"- or ¾"-thick stock (we used walnut) to 4¼×5¼". With carbon paper or by adhering a photocopy, transfer the full-sized oval pattern shown *below left* to the center of the stock.



Supplies: 18×½" brads, silicone sealant, double-faced tape, clear plastic (DuPont Mylar) page protector, finish.

BUYING GUIDE

- **Carbide-tipped router bits.** ½" flush-trimming bit with ½" bearing, catalog no. S8016Y, $8; add $3.25 for ⅜" replacement bearing (used to cut the rabbet). 5/32" Roman ogee, catalog no. S5705Y, $16. 3/16" round-over bit, catalog no. S506Y, $11. Add $2.50 for shipping. Cascade Tool Co., Box 848WD, Mercer Island, WA 98040. Or, call 800-235-0272.

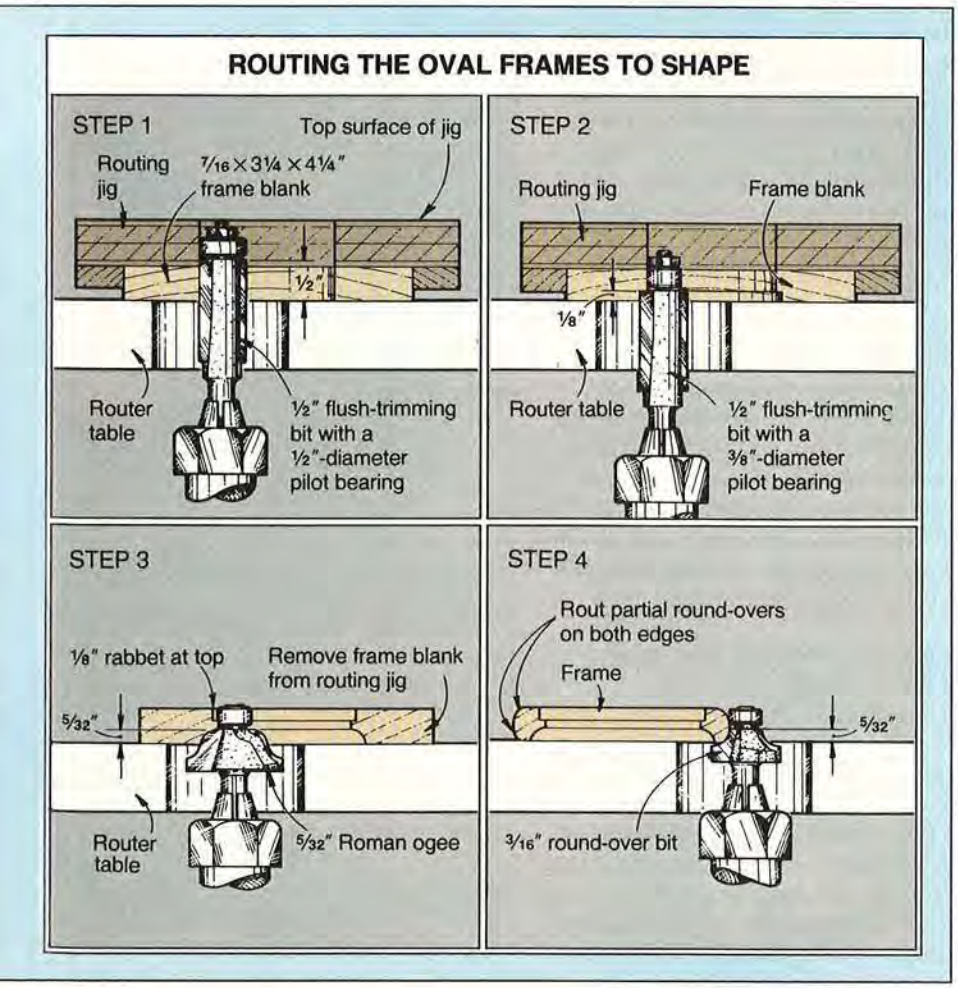


PICTURE FRAMES
TO SHOWCASE THOSE SPECIAL PHOTOS

2 Drill a blade-start hole, and carefully cut and sand the opening to shape. (We cut the oval with a scrollsaw and sanded the opening smooth with a 1" drum sander.)
3 Construct the jig shown on the Routing Jig Drawing on the opposite page. Drill a ¾" hole through a corner of the jig.

CUT AND ROUT THE OVALS TO SHAPE

1 Cut a piece of 7/16" stock to 3¼×4¼" for each frame desired. (We planed a 3¼"-wide by 18"-long piece of ½" walnut to 7/16" thick. Then, we crosscut four 4¼"-long blanks from the length.) Check for a snug fit of the frame blank in the routing jig opening.
2 Fit a frame blank into the jig. Bore a ⅝" hole through its center.
3 Mount a ½" flush-trimming bit with a ½" pilot bearing to your table-mounted router. Position the jig and bit where shown on Step 1 on drawing *below*. See the Buying Guide for our source of bits.
4 Start the router and run the bearing along the inside edge of the jig to rout the oval interior.
5 Switch to a ⅜" pilot bearing on the router bit, lower the bit to the level shown on Step 2 of the drawing, and rout a ⅛"-deep rabbet along the bottom of the blank.
6 Stick a dowel through the ¾" hole in the jig to push the blank free. Follow Step 3 on the drawing to finish routing the interior.



7 Set the pencil in a compass 5/16" from the point. As shown in the photo *below,* stick the compass point *in the rabbet*, and mark the oval exterior onto the blank. Cut the frame exterior to shape.

With a 5/16" gap between the lead and point of the compass, mark the oval perimeter on the frame.

8 Using a 3/16" round-over bit and Step 4 on the 4-step drawing at *left* for reference, rout round-overs on the outside edges of the oval frame.

THE INSERTS COME NEXT

1 Lay the frame, rabbet side down, on a piece of 3/16"-thick stock. Hold a sharpened pencil at an angle, and trace the rabbeted opening's shape onto the 3/16" stock for the insert. Cut the insert to rough shape, cutting slightly outside the marked line. Sand to the marked line, and check the fit of the insert in the rabbeted opening in the oval frame. (We left about 1/32" gap between the frame and insert.)
2 Sand a chamfer along the back edge of the insert where shown on the Exploded-View Drawing.
3 Using the insert as a template, cut a piece of clear plastic (we used a Mylar page protector available at office-supply stores). Now, utilize the oval plastic insert as a template to cut the photo to shape.

Continued on page 90

Print this article

TULIP TIME AT YOUR LATHE

CANDLE HOLDERS WITH A FLARE

Another in a collection of designs from the nation's top woodturners

Armed with a degree in woodworking and furniture design from Indiana University of Pennsylvania, Mark Burhans headed for the lathe to put his knowledge and skills to work. Six years later, this full-time turner/furnituremaker markets a line of turned candle holders and weed vases. Mark, who lives in Athens, Ohio, prefers the local Appalachian hardwoods, such as cherry and walnut, for his creations.

Mark Burhans

MOUNT THE STOCK AND TURN IT TO SHAPE

Mark starts by fastening a 3×3×4½" block to his 3" faceplate. "I use a 1" spindle gouge ground to a 50° angle for roughing the block to a cylinder," Mark says. "All that's required is a sharp edge, a light touch, and good eye protection." With a parting tool and a lathe speed of 1,230 rpm, Mark trues up the top (the end opposite the faceplate) of the holder. Then, he switches to a ½" spindle gouge to turn the exterior to shape. A skew is used to form the V-cut for the base. (Make a full-sized template for help if necessary.)

Mark then moves the tailstock around to the end of the candle holder and calls on a parting tool to form the tapered opening. Smooth cuts leave the Ohio turner with little sanding before parting the holder from the waste stock.

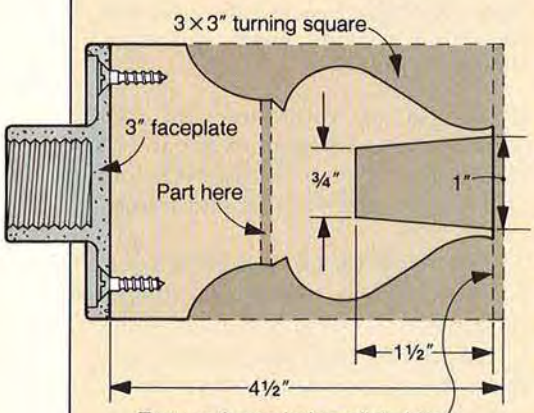
FLARING THE TULIP TOP COMES NEXT

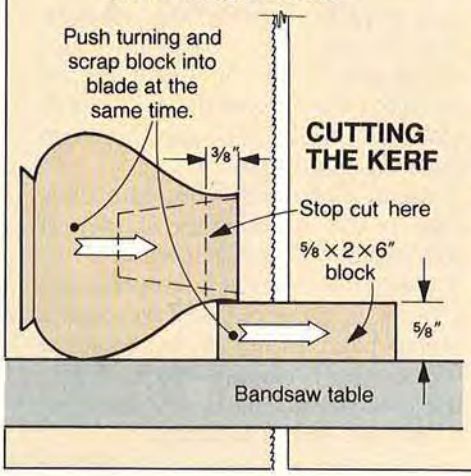
Mark supports the neck of the candle holder with a ⅝"-thick piece of stock, and cuts a kerf ⅜" into the center of the holder where shown in the drawing at *left*. Moving to a 1×42" strip sander, he slips the belt into the kerf and sands at an angle to flare the opening. Although it would take a bit more elbow grease, you also could file the opening to shape.

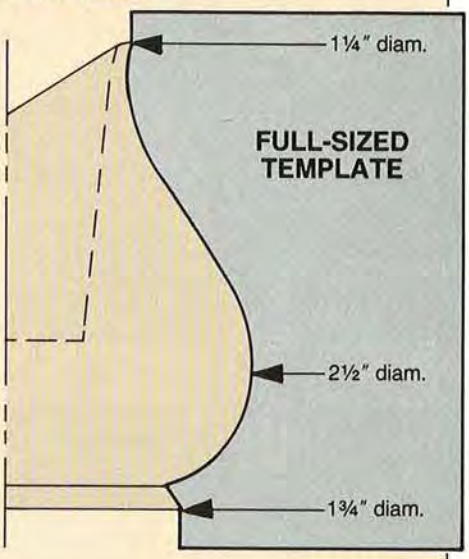
"I smooth the the sanded edges and finish-shape the flared top with a coarse and then a fine half-round file," says Mark (see the photo *below*). "Next, I wipe on a coat of Danish oil and let it dry. Finally, I buff the candle holder with a muslin buffing wheel loaded with tripoli (a jeweler's polishing compound)."

Project Design: Mark Burhans,
95 Morris Ave., Athens, OH 45701
Photographs: Jim Kascoutas; Brian Blauser
Illustrations: Kim Downing; Bill Zaun

Mark employs half-round files to smooth the belt-sanded edges of each candle holder.







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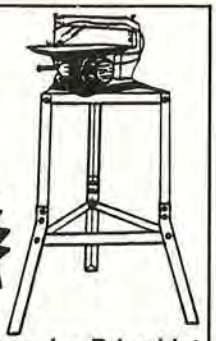

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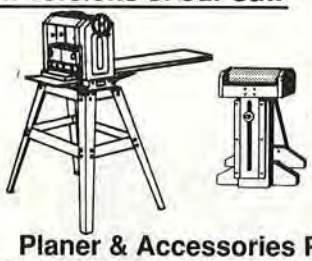

Free plans for roller stand with purchase of rollers

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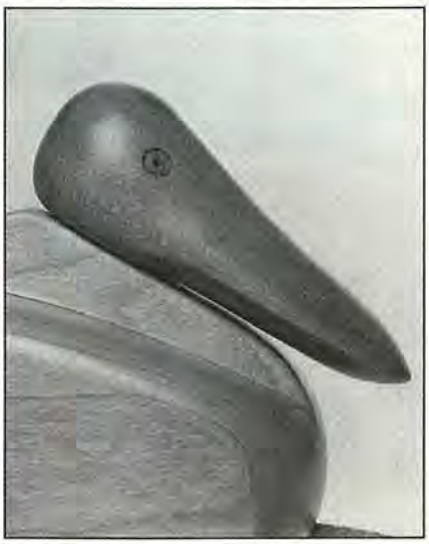
WADDLES THE DUCK

Continued from page 45



Using the photo above for reference, sand the head and body to shape.

3 With a drum or disc sander mounted to your drill press, sand the head to the shape shown in the photo *above*. Then, wrap 100-grit sandpaper around felt or foam, and hand-sand the head smooth. Repeat the hand-sanding operation with 150- and 220-grit sandpaper.

4 Drill a pair of 3/16" holes 1/16" deep in the duck head for the eyes where shown on the Head Pattern Drawing on page 45.

ADD THE WHEELS AND HEAD TO THE BODY

1 From 1/2" dowel stock, cut the wheel axle to 4". For ease of insertion into the wheels, sand a slight chamfer on each end of the dowel.

2 Push a thumbtack into each wheel where marked. The tack prevents the wheels from rubbing against the sides of the duck body.

3 From 1/4" dowel stock, cut the neck dowel to 2 1/4" long. Sand a slight taper on one end of the neck dowel. Hold a 1/4" nut with a pliers. Slowly rotate the tapered end of the neck dowel into the nut to thread the bottom of the dowel. After you've threaded the end of the dowel, remove the nut; we'll add it back after we've applied the finish. Glue the nontapered dowel end into the hole in the duck head.

4 Apply the finish to the duck body, head, and wheels (we left ours unstained and applied two coats of satin polyurethane). Mask the wheel axle to prevent getting any finish on it.

5 Stick the 1/4"-diameter, threaded neck dowel through the body. Holding a 1/4" nut with a needle-nosed pliers, thread the nut back onto the tapered end of the dowel. To keep the nut from ever falling off and being accidentally swallowed, add a few drops of instant glue to the nut and dowel.

6 Using white glue to extend working time, glue the axle dowel into the hole in *one* of the wheels. Wipe off excess glue. After the glue dries, stick the axle through the axle hole in the body. Glue the other wheel onto the dowel and immediately (before the glue sets), rotate the second wheel on the dowel until it aligns with the first wheel. Roll the assembly on a flat surface, the duck will roll smoothly and waddle easily once the wheels are aligned. Adjust the wheel alignment if necessary. Remove glue between the wheels and duck body with a damp cloth.

7 Cut a 30" length of 1/8" braided nylon. Tie a knot at one end and stick the other end through the rope hole in the duck body. Tie a second knot at the opposite end of the rope. Finally, give Waddles a pull and watch the kids—of all ages—come running.

BUYING GUIDE

- **Turned cherry stock.** 2 3/8" diameter by 6 1/2" long, $10.50 ppd. ($13 Canadian). Adams Wood Products, 974 Forest Dr., Morristown, TN 37814.
- **Cherry turning square.** 3" cherry turning square 12" long, catalog no. WD989, $9.50 ppd. ($12 Canadian). Constantine's, 2050 Eastchester Rd., Bronx, NY 10461.

Produced by Marlen Kemmet
Project Design: Neil Seely, Rochester, NY
Photographs: Hopkins Associates
Illustrations: Kim Downing; Bill Zaun

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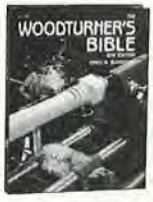

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PINT-SIZED PICTURE FRAMES

Continued from page 83

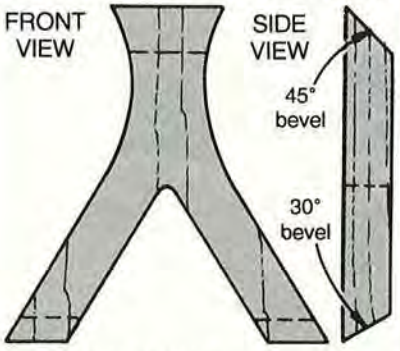
SHAPE THE FRAME SUPPORT

1 Transfer the front-view Support Pattern *below* to 3/16" stock. Cut the support to shape. Sand bevels on the support ends where shown on the Side View. (As an option, delete the support, and epoxy a magnet to the frame back for displaying photos on the refrigerator.)

2 Locate and glue the support to the back side of the insert.

3 Sand smooth, and apply finish to the frame, insert, and support.

FULL-SIZED SUPPORT PATTERN



FINAL ASSEMBLY

1 Adhere the photo to the front of the insert with double-faced tape.

2 Slip the clear plastic into the back of the frame. Center the insert in the rabbeted opening and temporarily hold in place with masking tape. As shown in the photo *below,* apply silicone to hold the insert in place. Wipe off excess sealant. If you wish to change the picture later, use a hobby knife to slice through the pliable silicone.

Apply silicone sealant between the frame and insert, and wipe off excess.

Project Design: Jim Boelling
Photographs: Hopkins Associates
Illustrations: Kim Downing; Bill Zaun

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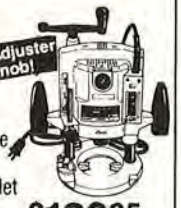

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See related article on page 46

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GLOBAL RELEAF

The American Forestry Association (AFA), with cooperation from the U.S. Department of Agriculture, the U.S. Forest Service, and private conservation groups, has launched a national campaign to reduce carbon dioxide buildup in the earth's atmosphere by planting trees. The program focuses on urban and rural areas and will assist less developed countries with forest preservation and reforestation. You can support the program financially, with donations starting at $15, or with involvement. Write: *Global Releaf, The American Forestry Association, P.O. Box 2000, Washington, DC 20013.*

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The EDF fights for national and international legislative action on a number of fronts, including wildlife protection, clean water and air, and forest preservation. Memberships start at $10 for seniors and students. For more information, write: *Environmental Defense Fund, 1616 P Street, Washington, DC 20077.*

GREENPEACE Known more for its seagoing efforts to stop the hunting of seals and whales, GREENPEACE actually encourages citizen action on a vast list of issues, including rainforest preservation. The organization's bimonthly magazine comes packed with timely articles and cites efforts you can join. Membership begins at $20. Write: *GREENPEACE USA, 1436 U Street, NW, Washington, DC 20009.*

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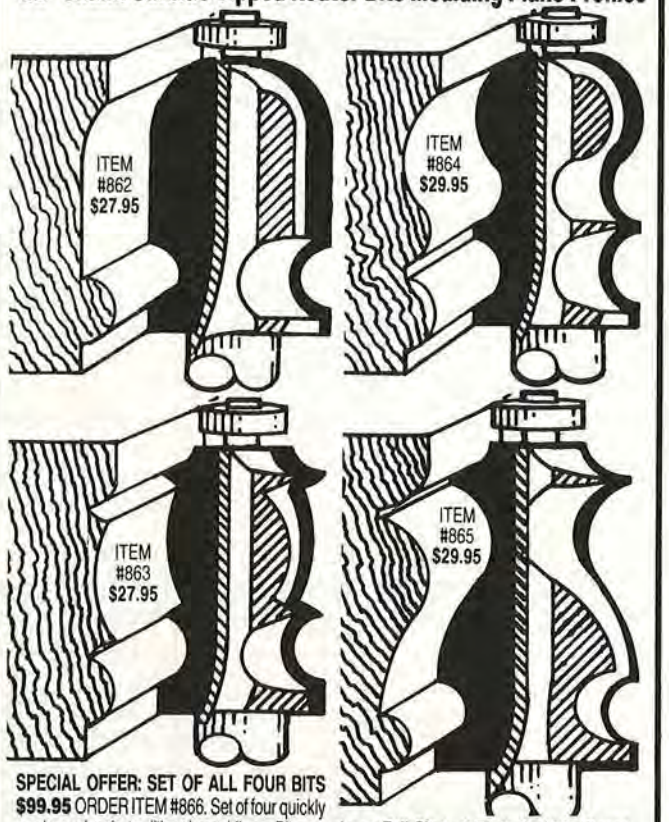

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TOOL INDUSTRY INSIDER

SCHEPPACH AIMS TO SERVE IN WAKE OF TOOLS-TO-GO DEBACLE

When Tools-To-Go, a Miami-based distributor of woodworking machinery, suddenly closed its doors for good in the summer of 1988, they left behind a trail of dissatisfied customers. Some woodworkers never received the equipment they ordered. Others who had purchased German-made Scheppach tablesaws, lathes, bandsaws, and other equipment were left wondering where they would find parts.

Now, Scheppach wants to see the needs of these customers served. Scheppach has provided transatlantic service since the downfall of Tools-To-Go and currently seeks an outlet to provide service in the U.S. To contact Scheppach for parts or information, write: Josef Scheppach, Maschinenfabrik GmbH & Co., D-8873 Ichenhausen, West Germany.

"BUYING U.S." ISN'T AS EASY AS IN THE PAST

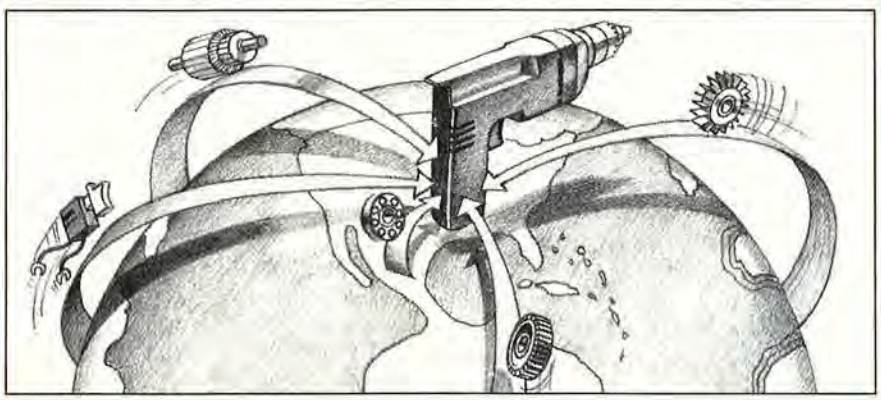
WOOD® magazine receives a lot of letters from readers interested in buying U.S.-made tools. "Who makes their tools in the U.S.?" they ask. It was a lot easier to answer that question 10 years ago, but in today's global economy, the answer can be mighty elusive.

For example, if you're looking for a tool with only U.S.-made parts, forget it. "It would take a bible-sized book to tell someone where all the parts for power tools come from," says Dennis Huntsman of Porter-Cable. With only one portable woodworking tool in its line made overseas—a 3¼" planer—Huntsman estimates that the Porter-Cable product line "is more U.S. than most."

Gary Compton of Bosch agrees with Huntsman's assessment. "You won't find any tool that's 100 percent sourced in the U.S. For instance, Japan makes nearly all the ball bearings in power tools."

Among complete-line stationary power tool manufacturers, Delta (formerly Rockwell) and Powermatic products were synonymous with U.S. production. Now, because of foreign competition—primarily from the Orient—both firms manufacture some of their less-expensive machines in Taiwan.

One stationary-machine firm—Shopsmith—has resisted the shift to Taiwan. "We took a hard look at having some products built overseas, but we decided against it in order to maintain our quality levels," says Shopsmith's Scott Phillips. "We did see some benefit in exploring the idea, however. When we told the U.S. foundries manufacturing our castings that we were looking abroad for casting sources, their prices suddenly tumbled. Also, both quality and delivery times improved." Shopsmith manufactures its complete line of equipment in Dayton, Ohio.



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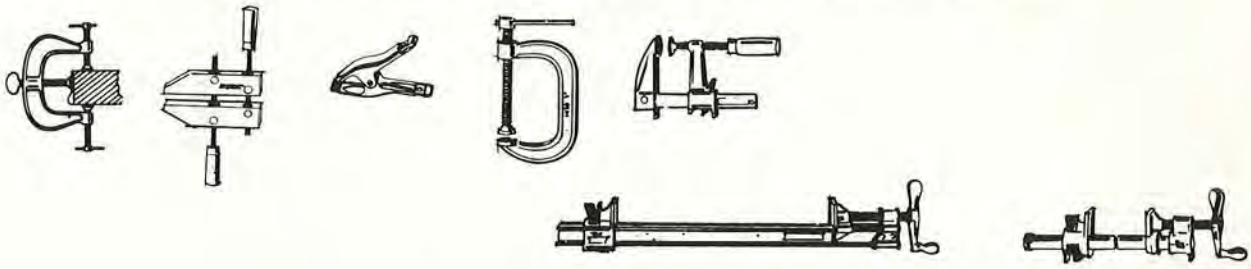

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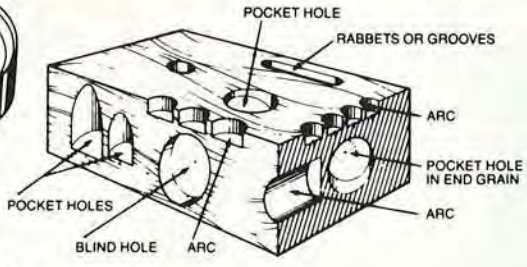

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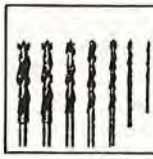

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Chimneys need to be cleaned and maintained on a regular basis to prevent the dangerous build-up and combustion of creosote. Even the smallest accumulation of soot can be a threat to home safety, and there are millions of dirty chimneys out there just waiting for disaster to occur.

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A quarter inch of soot contains a highly flammable substance called creosote. If a spark from your fireplace or woodstove ignites the creosote in your chimney—watch out! The draft gets stronger and stronger, and before you know it, the entire inside of the chimney catches on fire...and this excessive heat of the chimney can ignite the wood framing of your house.

There's really only one way to prevent these disasters from happening, and that's to clean a chimney before it catches fire. This is where you enter the picture...as a professional chimney sweep with the August West System.

The Mother Earth News calls it, "The Height of Technology," and we must admit there's nothing else like the August West System—the professional's choice!

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10 chimneys	× $55 ea.	= $550 Sat./Sun.
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NOW HEAR IT FROM THE SWEEPS

When Chimney sweep ***Tom Anderson of Irmo, South Carolina*** isn't out brushing flues, chances are you'll find him behind a news desk brushing up on the weather forecast he's about to deliver on WIS-TV in Columbia, South Carolina. ***"In my first year as a sweep, I earned just five hundred dollars less than my yearly radio income...the second year saw a 55% increase in income over the first year."*** Not bad for a part-timer!

Diane and John Goodman of Montana who said: ***"Earn $1,000 a week, right??? RIGHT!!! From day one we saw sweeping with the August West System as a fast way to reach our goal to build a house in the mountains. Our hard work has paid off, and the house is now completed."*** Not bad for a former insurance agent and nurse who traded their ties and titles for top hat and tails.

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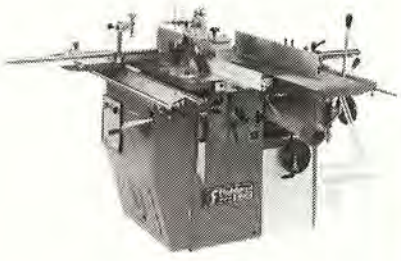

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Whether your woodworker's license reads "Beginner," "Intermediate," or "Advanced," you're bound to have a few questions about your favorite hobby. We can help. We'll consult our staff and outside experts for answers. Send questions to:

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***WOOD*® Magazine**
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Print this article

Due to the volume of mail, we can't promise to answer all questions, but we'll try. We may edit letters selected for publication.

LOOKING FOR A FEW FAVORITE WOODS

I have a problem obtaining two favorite woods in 2″ thickness or greater. Beech has disappeared except for an occasional board. And, I can't find the other, American mahogany, with the straight grain necessary for carving.

—John Jankowski, Richmond, Va.

Beech—especially in thickness 2″ and larger—can be tough to find because it isn't stable when kiln-dried, according to Bob Carr at EDLCO in Asheville, N.C. Bob suggests you try to match maple or birch for furniture repair. If you call Bob at 704/255-8765, he'll remember to keep his eyes and ears out for those thick slabs of beech you desire. But, your best bet may be air-dried beech from a local sawyer.

As for mahogany, hardwood dealers today import much of the genuine mahogany—also known as Honduras or American mahogany—from Brazilian plantations. Ask your lumber dealer to help you find the straightest grain on the market.

After talking with John, we learned he repairs a lot of 18th- and 19th-century furniture. The mahogany he buys—even the premium grades—has a clockwise or counterclockwise twist that John finds objectionable for hand carving.

CHERRY HOTLINE

I am a subscriber to *WOOD* magazine, and I really enjoy your publication. I would like to know how to achieve the deep burgundy of cherry like the furniture in stores. Is this a different type of furniture or is the finish? I want the deep, dark, almost black found in stores.

—Holly Coleman, North Powder, Ore.

Patience, Holly. Light-sensitive cherry darkens with age. Finish and aging will darken the freshly milled cherry you see in hardwood stores. But, the process could take up to two years. Some woodworkers add cherry-colored stain product to speed the darkening.

Continued on page 101

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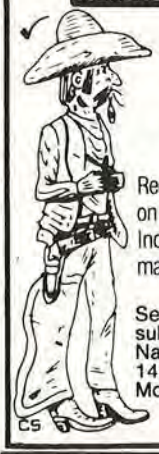

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ASK WOOD

Continued from page 98

I cut down a cherry tree about a year ago, and decided to save a few limbs for turning on my lathe. I stored the limb pieces in my garage for drying. Later, when I decided to turn a few pieces, I discovered that all the logs were so badly checked that I couldn't use them. How do you prevent wood from checking?

—S.B. Quincy, Bloomington, Ill.

We coat the cut ends of wood with paraffin, although paint works well, too. Sealing the end grain slows the release of moisture and lessens the chances that the wood will check. Remember to leave the bark on the limbs and dry them slowly.

THAT DEVIL, SILICONE

I built a table about a year ago and finished it with polyurethane. Recently, I decided to put on additional coats. To my surprise, the first coat turned out be fish-eyed looking. What did I do wrong? Could it have been the furniture polish?

—Albert Turner, Plano, Texas

In a word, yes. You've been unlucky enough to find out why many people avoid aerosol "polishes" that contain silicones—they're the culprits that cause fish-eyes in finish. Albert, you'll have to remove all the finish and start over. For more information about problems with silicone polishes, see our furniture-waxing article in the June 1989 issue.

CHAIR ON THE LOOSE

I'm looking for advice on tightening some loose legs and rungs on my antique oak plank chairs. I want to take the legs and rungs completely apart so I can properly re-glue all the joints. I tried to loosen the parts by twisting them, but had no success. What method or technique could I use to remove the partially glued parts?

—Daryl Rabert, Chicago

Daryl, an article in our August 1989 issue had some good tips about using bar clamps to gently break glue joints. Also, try dabbing finish stripper around the joint—but be careful if you don't plan to refinish the chair. (It may take a second or third application to make this work.) And, if that doesn't do the trick, flow on a solvent such as acetone or lacquer thinner while working the parts back and forth. We recommend expoxy glue to reassemble the chair. Epoxy fills gaps, dries hard, and cleans up easily.

Continued on page 103

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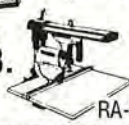

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ASK WOOD

Continued from page 101

FILLING IN A READER ON FILLERS

I've read several articles advocating the use of special wood filler on porous woods such as walnut and oak.

I've tried repeatedly to find this filler in my area, only to be met with blank stares in paint stores. I've looked in wood hobby shops, hardware stores, paint-supply stores, and lumberyards. All offer to sell me wood filler (putty used to fill cracks and holes), but only one person admitted to knowing there was another type of filler.

—Larry A. Wolfe, Pratville, Ala.

Larry, we turned to Jim Boelling, our Project Builder, for an answer: "As I see it, Larry's problem is that he's asked clerks—who might not know a lot about finishing—for the wrong product. And, paste wood filler is not in heavy demand.

"Much of the trend in the last 15–20 years has shifted away wood fillers because open grain has been more popular. Unfilled, open-grained woods absorb more pigment color from stains, and accentuate the grain. On the other hand, filler has a tendency to uniformly smooth out natural grain contrasts (heartwood and sapwood). Thus, wood fillers have a more subtle overall effect on color and grain.

"Sherwin-Williams Co., with more than 2,000 stores, sells a product called "Fast-Dry Semi-Paste Filler" (catalog no. D70T1). Also, Pratt and Lambert sells a natural paste filler (catalog no. F24)."

WHAT'S THE ACTUAL DIMENSION?

I have a problem. When I want to make a spice rack, jewelry box, or any other project, the plans often call for ½" wood. I know that a 2×4 isn't exactly 2"×4", but a lot less. But how do they measure hardwood?

—Alice Dubamel, Iron Springs, Alberta

This is one of the mysteries of buying wood, Alice. Lumberyards sell dimensional material. Today, a 2×4 actually measures 1½×3½". A hardwood lumberyard, however, sells by the board food (1" thick, 12" wide, and 12" long equals 1 board foot). You should find most ½" hardwood boards, for example to measure ½". But check carefully: The mill may leave the ½" board slightly rough at 17/32". If they dress it down to 7/16", they may charge more.

Continued on page 105

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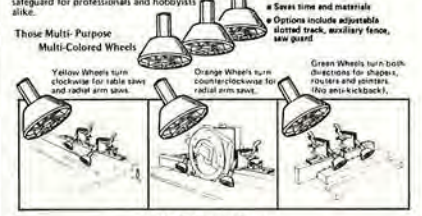
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ASK WOOD

Continued from page 101

FINALLY, A WOOD SHOW IN DES MOINES

Occasionally, *WOOD* magazine readers from central Iowa will call our office and ask, "Where's the nearest woodworking show I can go to?" Up until now, we've had to shuffle them off to Minneapolis, Chicago, or Kansas City. But now, we're happy to report that the Woodworker's Fair 89 will come to the Iowa State Fairgrounds in Des Moines Oct. 27–29. In addition to exhibitors and a full schedule of seminar speakers, this show will feature several swap tables for antique and collectible tools. For more information, call 800-441-0399 or 515/278-2126.

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—Jack A. Loganbill, Woodridge, Ill.

Jack, we normally turn to our friends at the Center for Occupational Hazards on questions such as these. Their executive director, Michael McCann, suggests that exhausting to the outdoors remains the only effective way to remove fumes. Consider installing an exhaust fan. Michael doesn't recommend using lacquer solvents near gas furnaces or water heaters.

MOISTURE ROUNDUP

We get a couple of letters each month from readers who uncover wood that's been stored for "years and years." Even wood stored for decades, may not be at the optimum 7 to 9 percent for furniture-making. Put a moisture meter to the wood before you saw.

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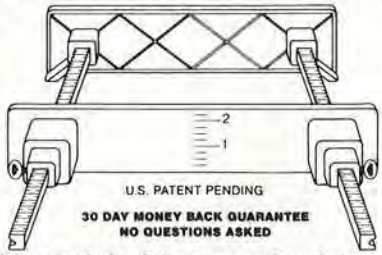

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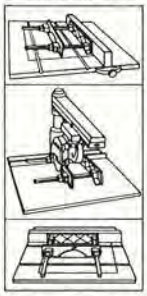

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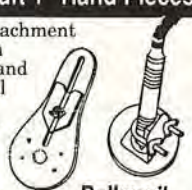

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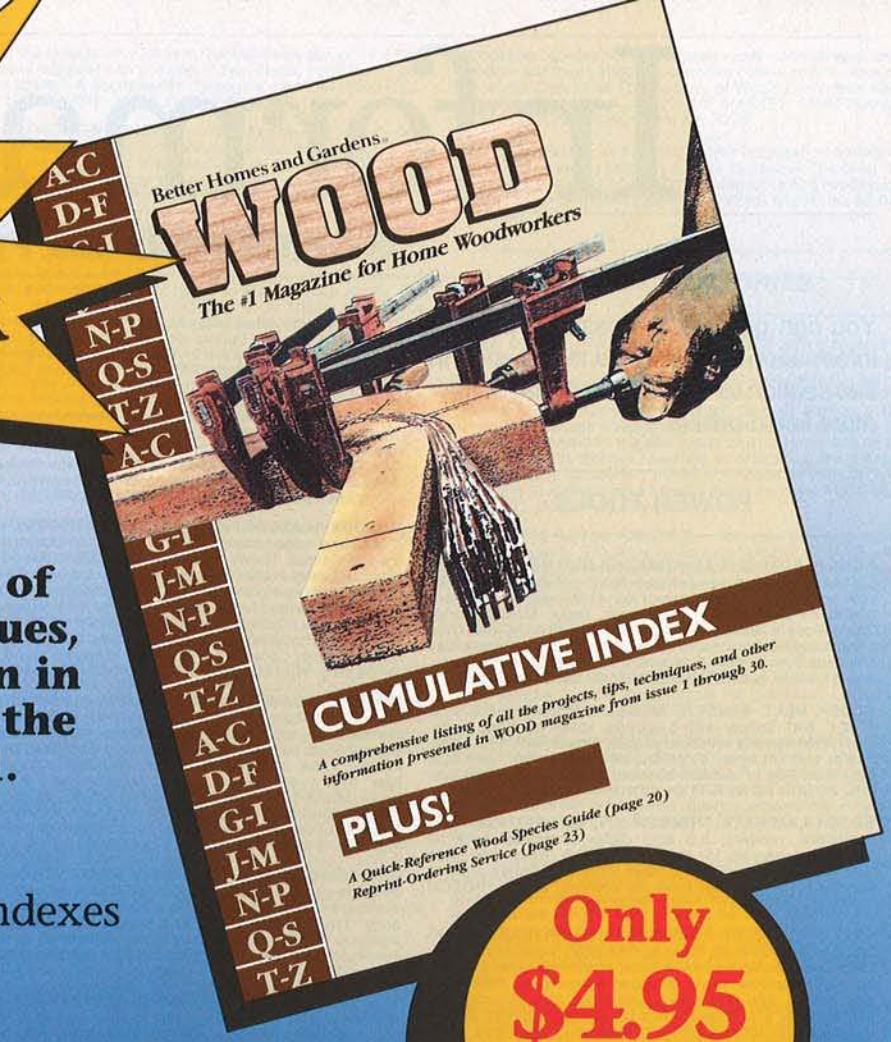

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CARBIDE TIPPED ROUTER BITS AND SHAPER CUTTERS — Over 400 router bits and shaper cutters displayed in catalog featuring 6 piece cabinet sets, 3 piece ½-in.shank router bit panel raising system, and 3 wing industrial shaper cutters. An outstanding selection of top quality shaper cutters available in ½-in. - 1¼-in. bore, and router bits offered in ¼-in. and ½-in. shank at the industry's best factory direct prices. CASCADE PRECISION TOOL CO. $1.00. *Circle No. 1315.*

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WOODWORKING TOOLS — Freud provides the finest in hand tools, carbide cutting tools, and hand held power

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tools. From drills and sanders to carbide saw blades and router bits. Send for catalog. FREUD. $1.00. *Circle No. 1321.*

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WOODWORKER'S SPECIALTIES—64-page catalog of plans and hard-to-find hardware for woodworkers. Dozens of door harp plans, wood toy plans & accessories, including wood wheels. Also wood turnings, brass hardware, canister liners, stencil supplies, & wood cutouts. MEISEL HARDWARE SPECIALTIES. $1.00. *Circle No. 1455.*

WOOD TOY PATTERNS — Patterns for all ages including childrens' patterns and executive toys. New catalog has many new patterns to choose from including parts and wheels. Send for new catalog and receive a coupon for free wheels and axle pegs. TOYS AND JOYS. $1.00. *Circle No. 1480.*

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MISCELLANEOUS

FOLEY-BELSAW INSTITUTES' NEW WOODWORKING CORRESPONDENCE COURSE—for people with the desire to learn how to work with wood and the proper use of tools. Create over 20 projects using professional plans and tools like a table saw, router with stand, and more...all included with the course. Complete money-back guarantee. Send for details. FOLEY-BELSAW INSTITUTE. Free. *Circle No. 1930.*

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THE NATURAL CHOICE: SOLID WOOD PLANK PANELING—The paneling choice of the future—here today. For today's home or commercial use. Full color brochure with room paneling applications, some of the standard profiles, installation and finishing recommendations. Design your showcase room with this simple alternative. WOOD MOULDING & MILLWORK PRODUCERS ASSN. $1.00. *Circle No. 2085.*

WOODWORKING ASSOCIATION OF NORTH AMERICA — First international association for woodworkers. Benefits include our quarterly magazine *International Woodworking*, specials from selected manufacturers, access to the woodworking network. WOODWORKING ASSOC. OF NORTH AMERICA. 50¢. *Circle No. 2092.*

CARVING SUPPLIES

DECOY AND WOOD CARVERS WISHBOOK—48-page catalog features wide selection of tools and supplies for decoy carvers, wood carvers, wood turners. Chisels, gouges, sharpening stones, precision grinding tools, Foredom tools, Fire Brush burners, pneumatic sanders, glass eyes, pewter feet, patterns, paints, reference books. P. C. ENGLISH, INC. Free. *Circle No. 2115.*

WOODCARVING TOOLS — Whittlers and carvers — Warren Tool Co. offers a catalog for you full of whittling and carving hand/power tools, books, stones, wood, and supplies. Since 1927, the finest in woodcarvers tools. WARREN TOOL CO., INC. $1.00. *Circle No. 2185.*

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BUILD HEIRLOOM CLOCKS — Now create beautiful heirloom quality clocks right in your own home. Choose from magnificent chiming grandfather clocks to charming wall clocks. 32-page catalog also offers a selection of music boxes, music movements, traditional barometers, and a huge variety of quartz movements and dials for custom clock building. Satisfaction guaranteed. CRAFT PRODUCTS CO. Free. *Circle No. 2320.*

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Model		List	Sale
23-700	Wet/dry grinder	201	159
23-680	6" bench grinder ¼ H.P.	81	66
23-980	8" bench grinder ½ H.P.	136	105
23-960	10" bench grinder 1 H.P.	246	235
11-950	8" drill press	164	135
14-040	14" drill press	313	309
40-150	15" hobby scroll saw	179	135
28-160	10" hobby band saw	189	144
31-050	1" belt sander 2.0 amp	93	75
31-460	4" belt/6" disc sander	178	135
31-340	"NEW!" 1" belt/8" disc sander	226	169

DELTA STATIONARY

34-751	10" unisaw 1½ H.P.	1715	1339
34-740	Super 10" motorized table saw	590	439
34-429	10" tilting arbor bench saw 1½ H.P.	1479	1049
33-990	10" radial arm saw	727	555
11-072	32" radial drill press	487	399
37-280	6" motorized jointer	440	375
50-179	¾ H.P. 2 stage dust collector	435	339
50-180	1 H.P. dust collector	535	425
50-181	2 H.P. dust collector	750	615
37-154	Deluxe DJ-15 6" jointer w/¾ H.P. motor	1288	999
33-950	"NEW" 8¼" Sawbuck	742	559
34-330	"NEW" 8¼" Table Saw 13A	321	245
34-670	10" motorized table saw	437	325
34-985	⅛ H.P. stock feeder	698	545
28-560	16" 3 wheel band saw	545	379

MILWAUKEE TOOLS

0395-1	9.6V cdlss. drill w/case	264	159
0219-1	9.6V cdlss. drill w/case	277	165
0385-1	7.2V cdlss. drill w/case	174	115
0224-1	⅜" drill 4.5A magnum	179	109
0234-1	½" drill 4.5A mag 0-850 rpm	189	107
0244-1	½" drill 4.5A mag 0-600 rpm	189	107
0222-1	⅜" drill 3.5A 0-1000 rpm	159	97
0228-1	⅜" drill 3.5A 0-1000 rpm	154	90
0375-1	¾" close quarter drill	208	119
0379-1	½" close quarter drill	243	139
6539-1	Cordless screwdriver 190 rpm	108	65
6540-1	Cdlss. screwdriver w/bits & case	137	89
6546-1	Cdlss. screwdriver 200 & 400 rpm	120	75
3102-1	Plmbrs rt angle drill kit	295	175
3002-1	Electricians rt. angle drill	290	175
5399	½" D-hdle ham drill kit	299	179
1676-1	H.D. Hole Hawg w/cs	395	225
6311	2 sp SawZall w/cs	209	119
6405	8¼" circle saw	209	120
6750-1	Drywall gun 0-4000 4.5A	149	89
6798-1	Tek screwdriver	173	105
6507	TSC SawZall w/case	219	129
6170	14" chop saw	430	259
6012	Orbital sander 3⅔"x7⅜"	179	105
6014	Orbital sander 4½"x9¼"	189	110
6305	6½" cordless circle saw	284	165
6753-1	Drywall gun 0-4000 3.5A	129	83
6977	Var. temp heat gun	109	70
5397-1	¾" v. spd. hammer drill kit	227	135
5371-1	½" v. spd. hammer drill kit	313	179
3107-1	½" v. spd. rt angle drill kit	305	179
6754-1	Drywall gun 0-4000 4.5A	179	110
6747-1	Drywall driver-0-2500	149	89
0230-1	⅜" drill 0-1700 rpm	159	99
3300-1	½" v. spd. magnum rt angle kit	289	179
5660	Router 1½ H.P.—10 amp	299	179
5680	Router 2 H.P.—12 amp	350	205
5455	⅞" polisher 1750 rpm	199	125
6215	16" chain saw	280	189
8975	Heat gun	85	55
6365	7¼" circular saw	189	107
6366	7¼" circ saw w/fence & bld	198	112
6368	7¼" circ saw w/fence, bld & cse	226	129
0216-1	2 spd cordless drill Hi-torque	222	145
0235-1	½" drill keyless chuck mag	199	115
6015	¼ sheet pad sander	75	48
6145	4½" grinder 10,000 rpm	149	95
6142	4½" grinder 10,000 rpm w/case & access.	182	114
6141	5" grinder 10,000 rpm	159	99
0239-1	½" drill keyless chuck	189	114
6749-1	Drywall gun 0-2500 4.5A	189	115
6377	7¼" worm drive saw	275	159

FREUD SAW BLADES

⅝" Bore—Industrial Grade

CARBIDE TIPPED SAW BLADES

Item No.	Description	Diam.	Teeth	List	Sale
LU72M010	Gen. Purp. ATB	10"	40	58	39
LU81M010	Gen. Purp. TiCh.	10"	40	85	39
LU82M010	Cut-off	10"	60	77	49
LU84M011	Combination	10"	50	65	49
LU85M010	Super Cut-off	10"	80	96	57
LM72M010	Ripping	10"	24	57	38
LU73M010	Cut off	10"	60	79	42
LU87M010	Thin kerf	10"	24	60	40
LU88M010	Thin kerf	10"	60	74	49
LU96M010	Ultimate	10"	80	107	79
LU89M010	Non-ferrous metal	10"	72	87	65
PS203	Gen'l Purp.	7¼"	24	25	18
PS363	Plywood	7¼"	40	36	25
DS306	6" Dado - Carbide			184	109
DS308	8" Dado - Carbide			196	119
F8	1¼"x⅝" Biscuits 1000-Qty.			32	25
F10	2½"x¼" Biscuits 1000-Qty.			32	25
F20	2⅜"x1" Biscuits 1000-Qty.			34	28
FA	Assorts Biscuits 1000-Qty.			34	28
WC104	4 pce. chisel set w/case ¼"-1"			54	38
WC106	6 pce. chisel set w/case ¼"-1"			73	54
WC110	10 pce. chisel set w/case ¼"-1½"			119	74
FB100	16 pce forstner bit set ¼"-2¼"			284	159
54-100	5 pce router bit door system			284	159
JS100	Biscuit Jointer w/case			300	154
EB100	"NEW" edge banding machine			350	275

MAKITA CORDLESS

Model		List	Sale
6070DW	⅜" var. spd. rev. drill, 7.2v	123	75
6071DWK	⅜" var. spd. rev. drill w/removable batt, 7.2v	190	105
5090DW	3⅜" saw kit, 9.6v	243	129
5600DW	6½" circular saw, 10.8v	317	175
6010DWK	⅜" cordless drill kit, 7.2v	155	89
6010SDW	⅜" cordless drill, 7.2v	103	65
DA3000DW	⅜" angle drill, 7.2v	238	130
4390DW	9.6 volt cdls. recip saw kit	218	124
4300DW	Jig saw kit comp., 9.6v	220	125
6010DL	⅜" drill w/flashlight, 7.2v	198	113
6710DW	Cordless screwdvr kit, 7.2v	186	103
6012HDW	2 spd, driver drill w/clutch & case, 9.6v	224	115
6092DW	V/spd. drill, kit complete	237	120
6093DW	V/spd. drill w/clutch—complete	248	125
6891DW	Drywall gun 0-1400, 9.6v	225	119
632007-4	9.6 volt battery	49	30
632002-4	7.2 volt battery	42	28
5007NSA	7¼" saw w/elec. brake	228	125
5008NBA	8¼" saw w/elec. brake	276	149
B04510	¼ sheet pad sander	80	50
9900B	3"x21" belt sander w/bag	254	145
9924DB	3"x24" belt sander w/bag	268	155
9035	½ sheet finish sander	106	68
9045B	½ sheet finish sander	216	125
9045N	½ sht fin. sand. w/bag	219	127
4200N	4¾" circ. saw 7.5 amp	213	119
5201NA	10¼" circ. saw 12 amp	560	290
4301BV	Orb. v/sp jig saw 3.5 amp	274	149
JR3000NL	2 sp recip saw w/case	220	122
JR3000V	Vs. recip saw w/case	224	125
LS1020	New 10" mitre saw	440	235
9820-2	Blade sharpener	354	199
410	Dust collection unit	480	279
3705	Offset trimmer	255	145
1900BW	3¼" planer w/case	198	115
1100	3¼" planer w/case	381	219
9207SPC	7" sander-polisher	262	149
3601B	1⅛ H.P. router	242	139
3700B	½ H.P. trimmer	188	105
9501B	4" grinder, 3.5 amp	137	69
B04530	6" round sander	95	60
B04550	½ sheet pad sander w/bag	85	55
DA3000R	⅜" angle drill	256	145
DP4700	½" v/sp w/rev. 4.8 amp	198	119
HP2010N	¾" v/sp hammer drill w/case	285	159
2708W	8¼" table saw	474	259
2711	10" table saw w/brake	800	469
GV5000	Disc sander 5"	109	69
6800DB	2500 rpm 3.5 amp, drywall	140	89
6800DBV	0-2500 rpm 3.5 amp, drywall	154	95
6801DB	4000 rpm 3.5 amp, drywall	140	89
6801DBV	0-4000 rpm 3.5 amp, drywall	154	95
2030N	12" planer/jointer	2970	1699
2040	15⅜" planer	2470	1449
1805B	6⅛" planer kit w/case	545	359
JV1600	var. speed jig saw	220	125
JV2000	var. speed orb. jig saw	242	138
5005BA	5½" circular saw	211	119
9503BH	4½" sander-grinder	153	89
6404	⅜" drill 0-2100 rpm, 2 amp	102	65
6510LVR	⅜" drill rev. 0-1050 rpm	137	79
6013R	½" drill rev. 6 amp	240	135
5402A	16" circular saw - 12 amp	605	339
3612BR	3 H.P. plunge router	376	199
9401	4"x24" belt sander w/bag	302	169
3620	1¼ H.P. plunge router w/case	182	105
4302C	V/spd. orb. jig saw	287	149
5077B	7¼" Hypoid saw	248	139
LS1440	14" Mitre saw	624	409
2414	14" cut-off saw AC/DC	350	199
5007NB	7¼" circ saw 13 amp	209	119
3612B	3 HP plunge router sq/b	376	199

SKIL SIZZLERS

Model		List	Sale
5510	(551) 5½" circ saw	112	92
5625	(552) 6½" circ saw	175	115
5656	(553) 7¼" circ saw	132	105
5665	(554) 8¼" circ saw	204	129
5750	(807) 7¼" circ - drop foot	198	125
5765	(808) 8¼" circ - drop foot	215	135
5790	(810) 10¼" circ - drop foot	400	245
5825	(357) 6½" worm saw	229	139
5865	(825) 8¼" worm saw	250	155
4580	Vari - orbit jig saw w/case	144	98
3810	10" Mitre saw	263	195
595	3"x21" sander w/bag 5.5A	197	125
7565	¼" palm sander	52	42
7313	3x18 belt sander 4.5A	72	58
77	7¼" worm drive saw	230	139
5350	2½ HP circ. saw	80.99	69
5250	2¼ HP circ. saw	68.99	59

XTRA SPECIAL BY SKIL

2735-04	12v V.Spd. Cordless Drill comp. w/case & 2 Batt.	210	128

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D1258-12—List 314.00—Sale 265.00

D1258-24—List 375.00—Sale 305.00

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HITACHI TOOLS

Model		List	Sale
TR6	Trimmer	177	95
TR8	Plunge router, 1½ H.P.	219	119
TR12	Plunge router, 3 H.P.	354	175
C10FA	10" dlxe. mitre saw	490	275
C8FB	8½" slide compound saw	659	479
FREUD	LU91M008 - 8½" c/bld 48 tooth	58	45
C15FB	15" mitre saw	745	405
FREUD	LU85M015 - 15" c/bld 108 tooth	181	115

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PIRANHA By Black & Decker

CARBIDE TOOTH SAW BLADE

Model#	Diameter	#Teeth	List	Sale
73-716	6-1/2	18	13.10	7.10
73-756	6-1/2	36	28.96	16.30
73-717	7-1/4	18	13.14	7.10
73-737	7-1/4	24	16.36	9.00
73-757	7-1/4	40	29.72	16.35
73-758	8	40	42.04	24.15
73-759	8-1/4	40	42.86	24.60
73-719	8-1/4	22	18.96	10.60
73-739	9	30	31.48	16.25
73-769	9	60	66.58	35.90
73-715	5-1/2	16	13.00	7.30
73-704	7-1/4	18	19.50	12.49

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Model#	Diameter	#Teeth	List	Sale
73-740	10	32	33.20	15.95
73-770	10	60	61.46	29.95
73-711	10	50	65.08	29.95

JORGENSEN STEEL I-BAR CLAMPS

Model	Size	List	Sale
7224	24"	25.82	15.99
7236	36"	27.71	16.99
7248	48"	30.44	18.99
7260	60"	33.90	20.99

ADJUSTABLE HANDSCREWS BY JORGENSEN

Item No.	Jaw Length	Open Cap	List	Sale	Box of 5
#3/0	6"	3"	14.83	8.35	47.50
#2/0	7"	3½"	15.94	8.95	51.00
#0	8"	4½"	17.74	10.25	58.40
#1	10"	6"	20.29	11.95	68.10
#2	12"	8½"	23.29	13.75	78.00
#3	14"	10"	29.53	17.85	101.75
#4	16"	12"	38.38	23.00	131.95

STYLE 37 2½" Throat ¼"x¾" JORGENSEN

Item No.	Jaw Length	List	Sale	Box of 6
3706	6"	8.88	5.75	32.50
3712	12"	9.81	6.25	35.00
3718	18"	10.83	6.85	37.50
3724	24"	11.83	7.35	40.00
3730	30"	13.19	8.25	45.00
3736	36"	14.43	8.95	49.00

PONY CLAMP FIXTURES

Model		List	Sale	Lots of 12
50	¾" black pipe clamps	12.48	7.50	80
52	½" black pipe clamps	10.41	6.00	65

STYLE J. ADJUSTABLE HANDSCREW KITS

Model	Length Jaws	List	Sale
J04	4	7.10	4.99
J06	6	8.13	5.29
J08	8	9.12	5.89
J10	10	10.66	6.39
J12	12	13.21	7.69

BOSCH

Model		List	Sale
1581VS	Top hdle. jig saw	239	129
1582VS	Barrell grip jig saw	225	123
Bosch metal case for above jig saws		34	26
Bosch blade assortment for jig saws 30 of Bosch's best selling blades		23.99	
1942	Heat gun 650°-900°	99	69
3266	Heat gun 600° & 1000°	89	59
1272	3"x24" belt sander	279	159
1272D	3"x24" B.S. w/bag	299	168
1273	4"x24" belt sander	295	169
1273D	4"x24" B.S. w/bag	315	178
11-212	Bulldog ¾" SDS rotary	339	189
1196VSRK	⅜" v/spd hammer drill	215	110
1198VSR	½" v/spd hammer drill	229	129
1608	5.6 amp lam trimmer	140	87
1608L	Same as above w/trimguide	145	89
1608T	5.6 amp tilt base trimmer	159	99
1609	5.6 amp offset base trimmer	205	122
1609K	Lam installers kit w/1609	295	169
Offset base, trimmer tilt base, trimguide, ¼" collet, collet nut, wrenches, hex keys and case			
1601	1 H.P. Router 25,500 rpm	165	105
1602	1½ H.P. Router 25,000 rpm	199	125
1603	1½ H.P. D handle router	223	135
1604	1¾ H.P. 2 hdle. router	219	119
1604K	Same as above w/case & access.	269	165
1606	1¾ H.P. D hdle. Router	243	145
3258	3¼" planer w/blade guard	210	129
3270D	3"x21" belt sander w/bag 5A	225	139
1273DVS	Var spd. 4"x24" 6 speed range sander 10.5 amp	339	189
1611	3 H.P. plunge router	349	198
1611EVS	"NEW" 3 H.P. elec. v/spd. plunge router	410	255
1651	7¼ circ. saw drop foot	179	99
1654	7¼ circ. saw pivot base	179	99
1922K	Cdlss. jig saw w/case	239	165
1632VSRK	Recip. saw 8.4A orb. v/spd.	225	135
11-304	"The Brute" breaker hammer	1950	1185

BOSTITCH AIR NAILERS

Model		List	Sale
N80C-1	Utility coil nailer	730	399
N80S-1	Stick nailer	760	409
T36-50	Sheathing & decking stapler	550	309
N12B-1	Coil roofing nailer	725	405
N50FN-2	Finishing nailer	595	349
T31	Brad nailer	245	149

SENCO AIR NAILERS

Model		List	Sale
SFN1	Finishing nailer 1" - 2"	377	268
SFN2	Finishing nailer 1½" - 2½"	571	398
SN2	General purpose 1⅞" - 3"	621	445
M2	General purpose 1⅜" - 2"	475	349
SN4	General purpose 2" - 3½"	685	475
LS2	Pinner ⅝" - 1"	351	255
SK5	Stapler ⅜" - 1½"	351	245
LS5	Pinner, 1"-1½"	399	289
PW-RFR	Roofer, ½"-1¼"	351	249

WORKMATES By Black & Decker

79-032	#200, 23#	103.00	69.00
79-033	#300, 28#	117.00	75.00
79-034	#400, 35#	152.00	99.00

JET TOOLS

Model	Description	List	Sale
JBS-14MW	14" band saw, 1 H.P.	482	375
JTS-10	10" table saw w/stand, 1½ H.P.	554	435
JTS-12	12" table saw w/stand, 1½ H.P.	630	495
JWS-18	½"spindle shaper w/stand, 1 H.P.	479	365
JJ-4	4" jointer, ½ H.P.	310	269
JJ-6	6" jointer, ¾ H.P.	485	369
JWP12	12½" bench planer, 2 H.P.	569	385
JSG-6	6" x 48" belt & 12" disc sander, 1½ H.P.	634	485
OR1012	10" bench drill press, ½ H.P.	179	175
OR1458	14" bench drill press, ¾ H.P.	279	259
OR1758	17" bench drill press, ½ H.P.	319	289
OR1458F	14" floor drill press, ¾ H.P.	369	339
OR1758F	17" floor drill press, ¾ H.P.	395	349
OR2501F	20½" floor drill press, 1 H.P.	655	529

RYOBI SPECIALS

Model	Description	List	Sale
JP155	"NEW" portable 6" jointer/planer	545	329
R500	2¼ H.P. plunge router	326	159
TS254U	10" mitre saw	392	179
TS254US	10" mitre w/acc. kit & 60 tooth carbide blade	435	219
AP10	10" surface planer 13 amp	620	358
RA200	8¼" radial arm saw	515	245
RE600	3 H.P. plunge router	398	199
R150K	1 H.P. plunge router w/case	206	99
BE321	3"x21" v/spd. belt sander	259	125
BD1020ARK	7.2v cdls. drill w/case	193	79

PORTER CABLE

690	1 H.P. router 6.8 amp	170	110
690	1½ H.P. router 8 amp	215	122
691	1½ H.P. router D hdle	235	133
536	1½ H.P. speedmatic router	310	195
518	3 H.P. 5 speed router	560	339
520	3 H.P. 15 amp router	510	319
309	3.8 amp lam trimmer	135	85
695	1½ H.P. router/shaper	299	195
596	H.D. shaper table	155	119
351	3"x21" belt sander w/o bag	215	125
352	3"x21" belt sander w/bag	225	129
360	3"x24" belt sander w/bag	310	179
361	3"x24" belt sander w/o bag	290	175
362	4"x24" belt sander w/bag	325	185
363	4"x24" belt sander w/o bag	310	179
7556	½" right angle drill	295	175
315-1	7¼" top hdle 13 amp circ saw	195	115
9315-1	315-1 comp. w/case & carb. bld.	225	129
617	7¼" pushhandle 13 amp	195	115
9617	617 comp. w/case & carb. bld.	225	129
368-1	8¼" top handle 13 amp	205	135
314	4½" trim saw 4.5 amp	205	119
548	X HD bayonet saw	255	165
9548	X HD bayonet saw w/case	275	175
9629	Recip saw v/sp 8 amp	230	135
9627	Recip saw 2 speed 8 amp	220	125
666	⅜" H.D. v/sp drill 0-1200 rpm	185	122
621	⅜" H.D. v spd. 0-1000 rpm	155	95
320	Abrasive plane 3 amp	150	99
9118	Porta plane 7 amp kit	325	189
9652	Versa plane 10 amp kit	430	275
7545	0-2500 drywall gun 5.2 A	169	105
7540	0-4000 5.2 amp gun	165	99
505	½ sheet pad sander	195	109
7511	⅜" v spd. drill 5.2 amp	185	105
7514	½" v spd. drill 0-750	195	114
303	Paint remover	230	149
304	7" disc sander 4000 rpm	195	125
305	7" disc polisher 2000 rpm	195	125
367	3¼" planer 6.5 amp	225	148
537	1½ H.P. D hdle router	325	205
7548	Top hdl jig saw 4.8 amp	215	125
7646	Barrel grip jig saw 4.8 amp	210	133
330	Speed block sander ¼ sht	97	58
555	Plate biscuit jointer w/case	280	165
345	6" saw boss 9 amp	160	99
5060	"Stair Ease" stair templet	194	129
5061	"Stair Ease" hard wood	204	139
659	0-4000 drywall gun 4 amp	130	79
100	⅛ H.P. router	160	99
5008	Dovetail template kit	99.50	75
5009	Mortise & Tenon jig	54.95	45
7308	laminate slitter	189	139
5116	omni-jig	395	269
9647	TIGER CUB recipro saw	185	119
9850	12 volt cordless drill w/case	210	129
8500	Extra 12v battery	48	33
	NEW Tools By Porter Cable!		
7399	5.6 amp drywall cutout unit	120	79
7310	5.6 amp lam trimmer	145	95
7312	5.6 amp offset base lam trimmer	209	125
7319	5.6 amp tilt base lam trimmer	165	105
97310	LAM TRIM KIT W/STD. BASE, TILT BASE, OFFSET BASE, SLITTER BASE, GUIDE & CSE	330	189
7334	3.7 amp 5" random orbit sander 6000 rpm	205	129
693	1½ H.P. plunge router	280	169
97750	½" v/spd hammer drill w/case	260	169

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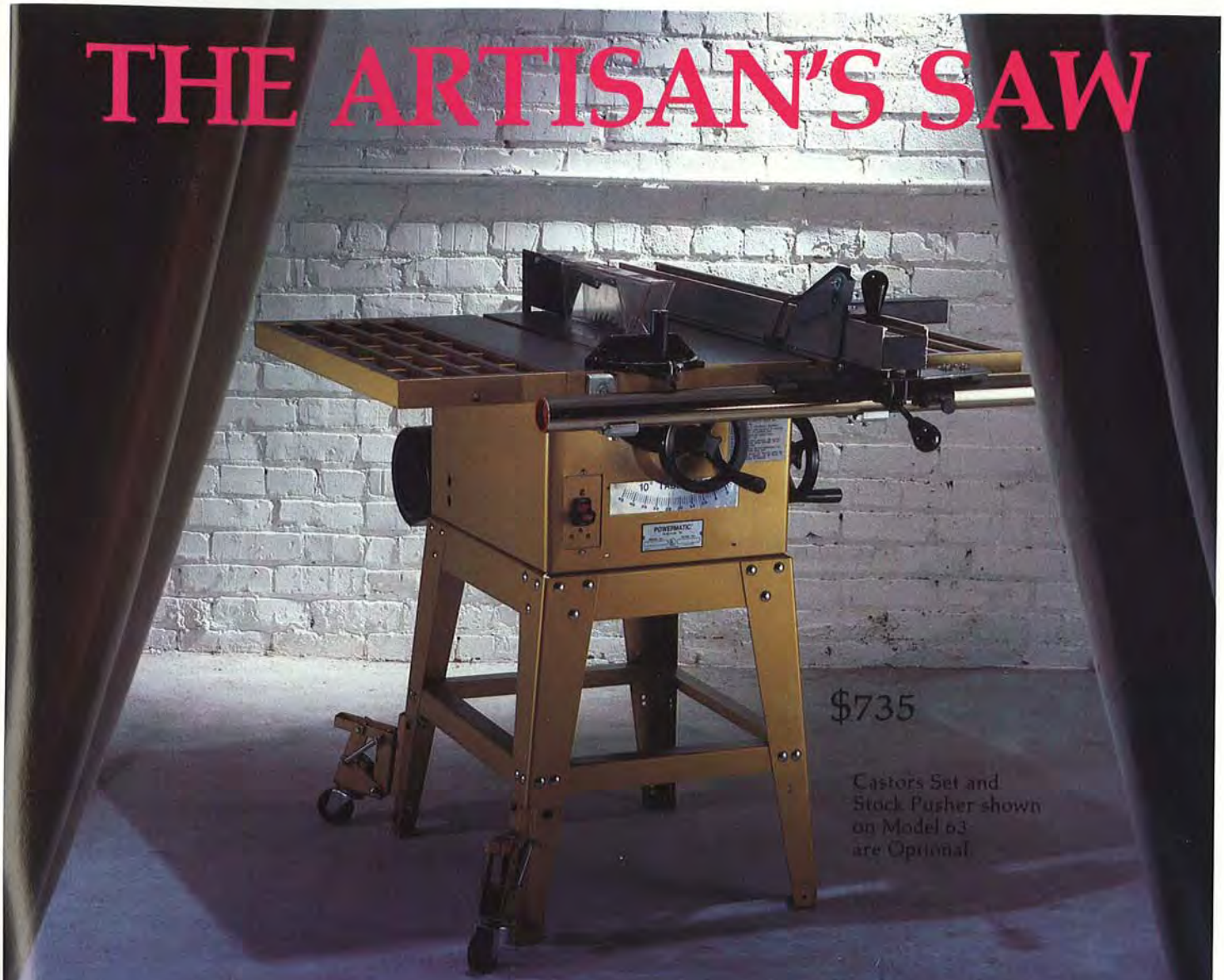

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